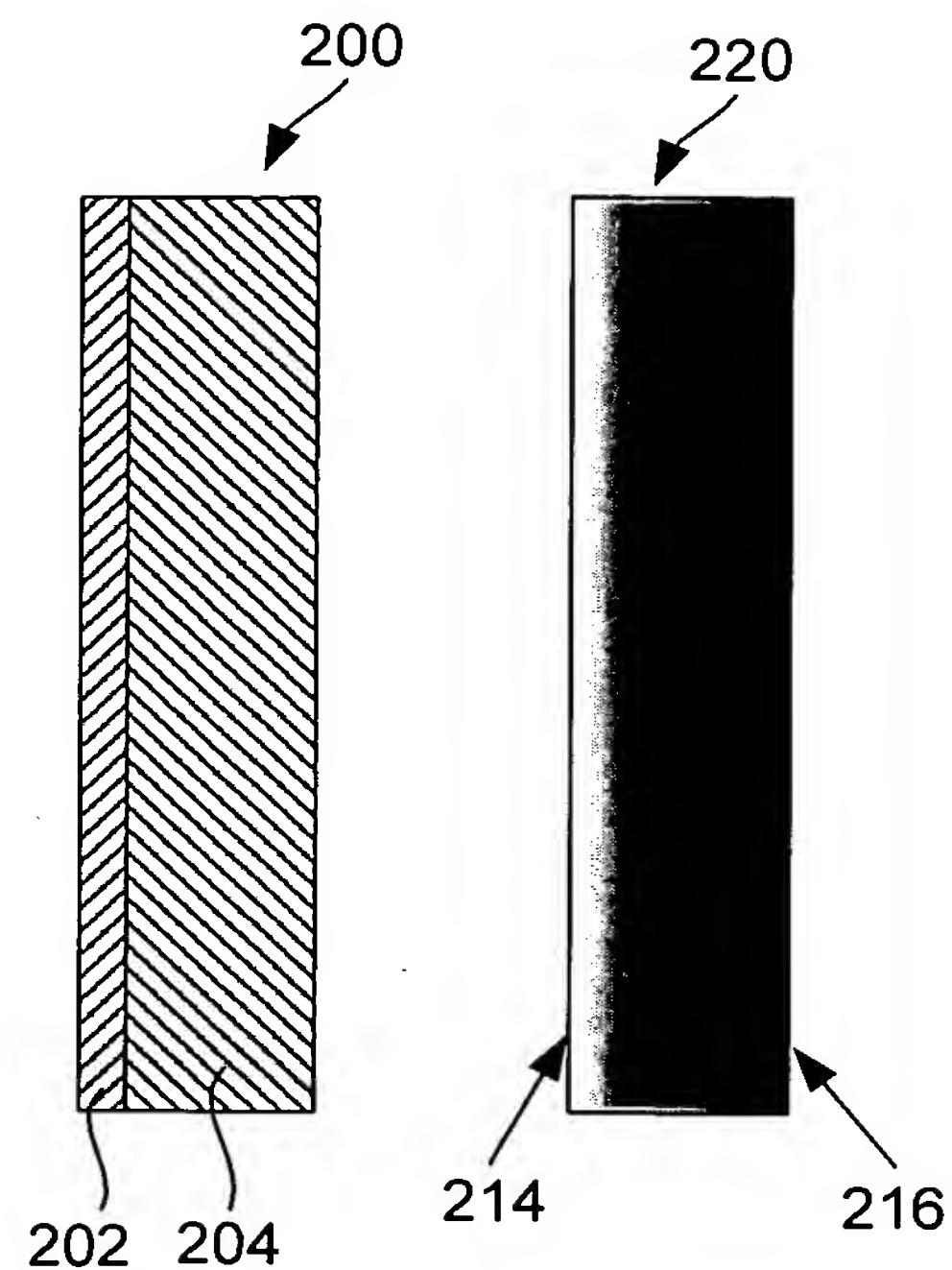
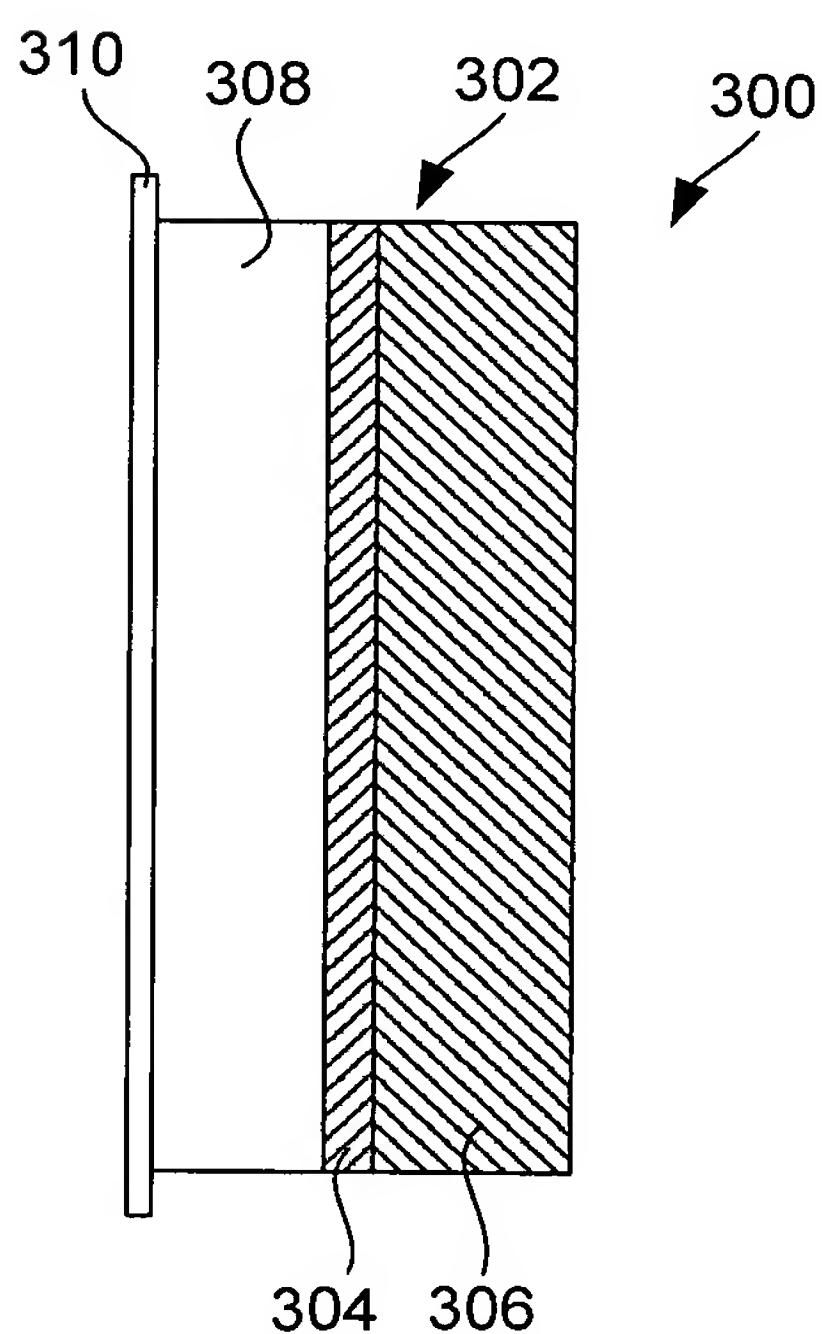


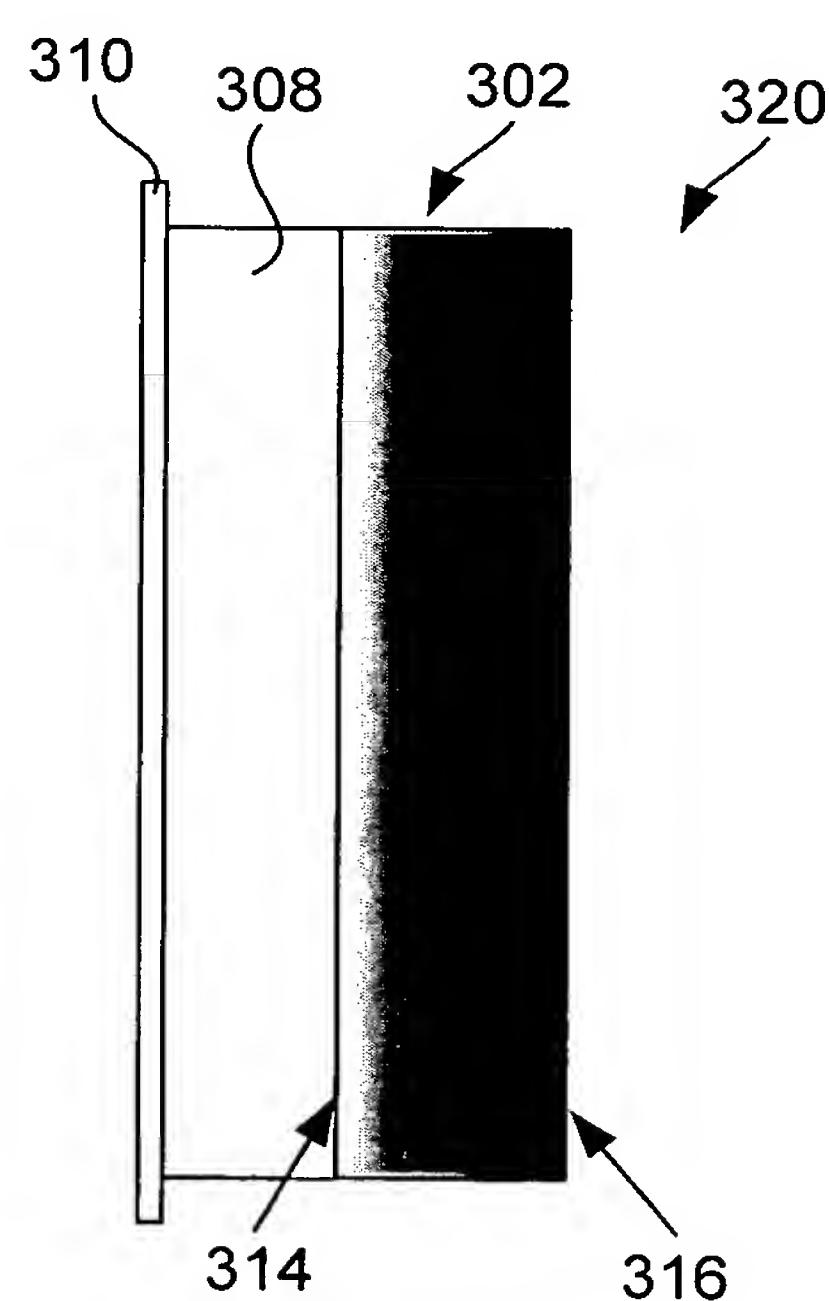
**FIG. 1**



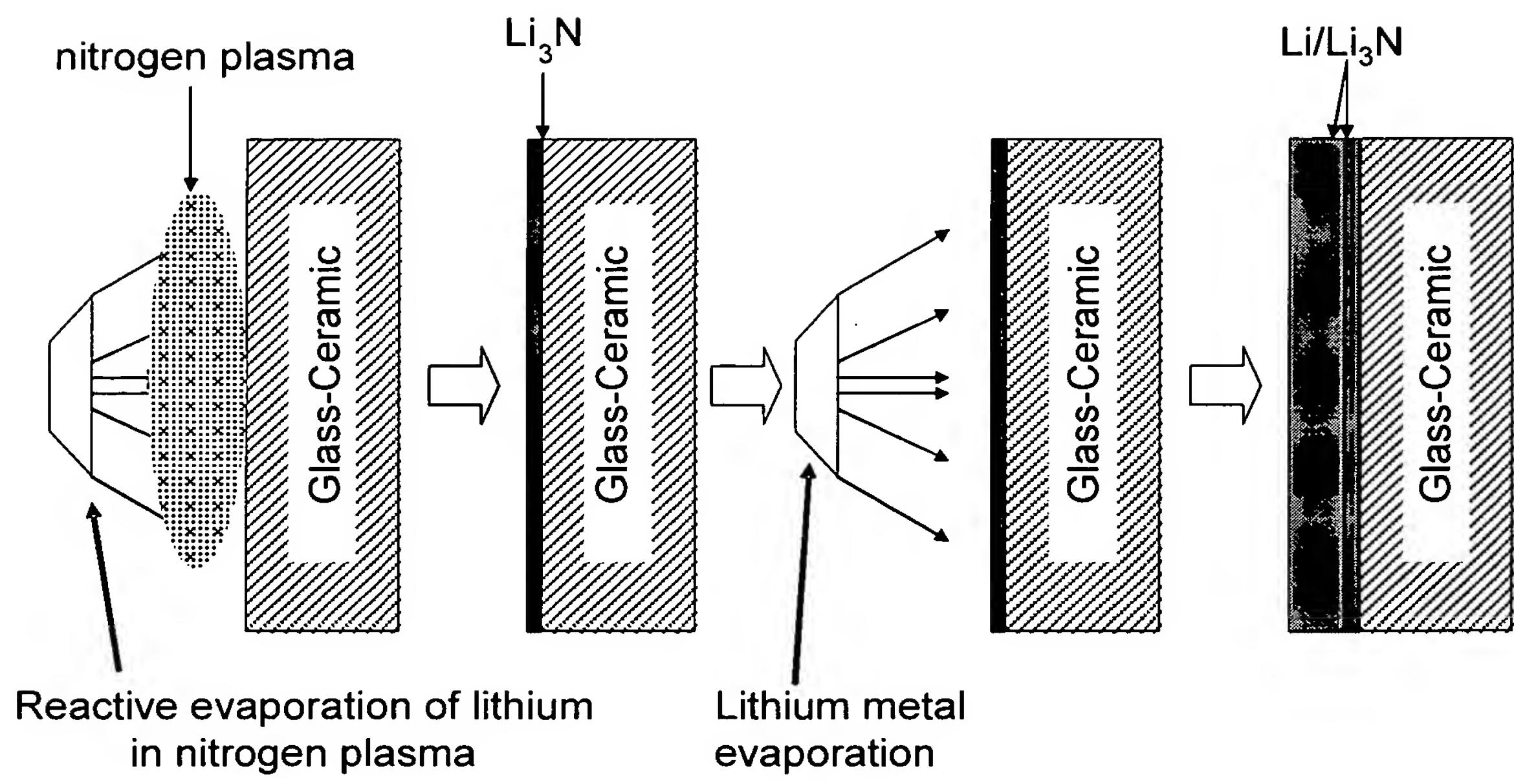
**FIG. 2A FIG. 2B**



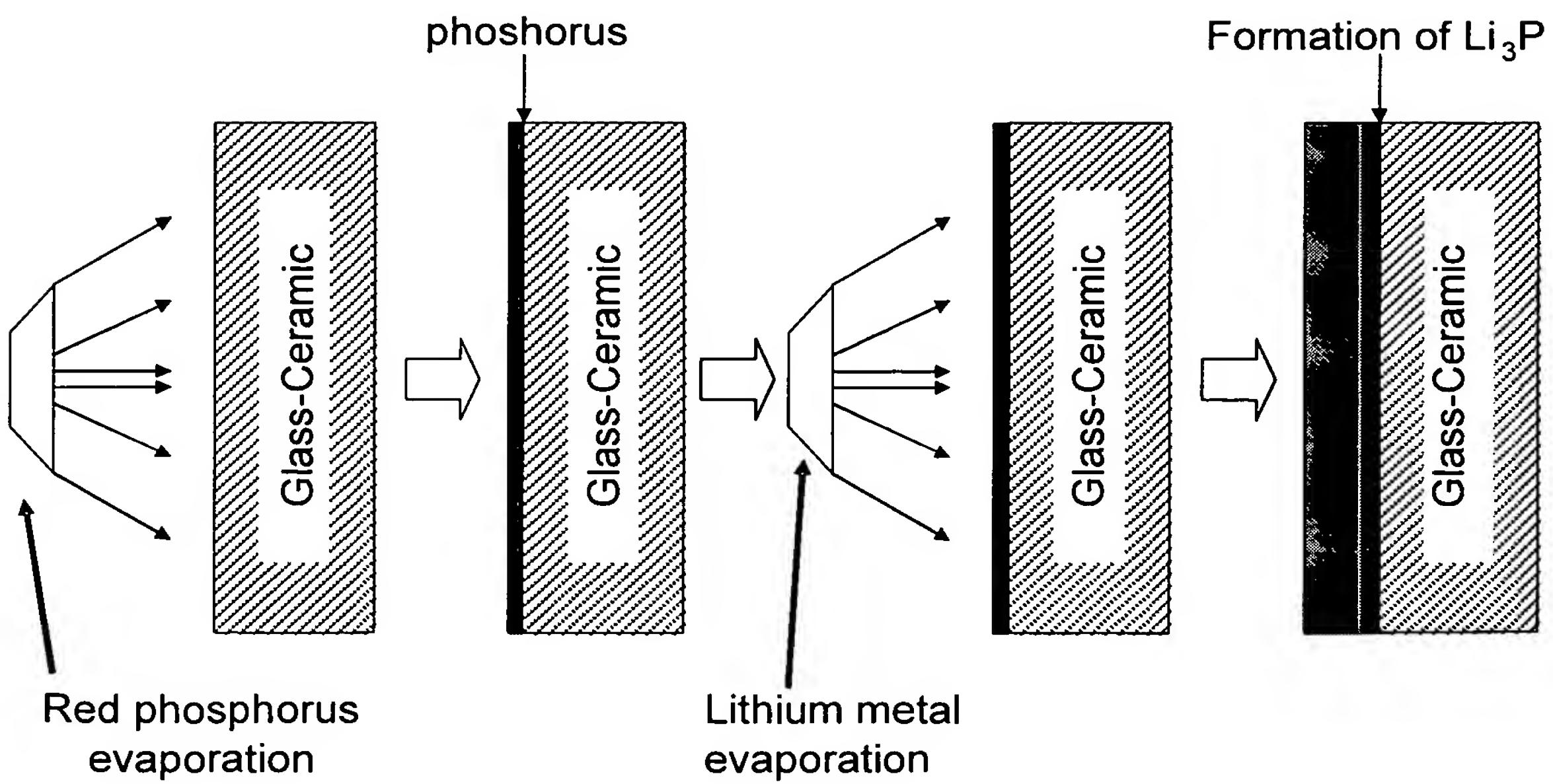
**FIG. 3A**



**FIG. 3B**

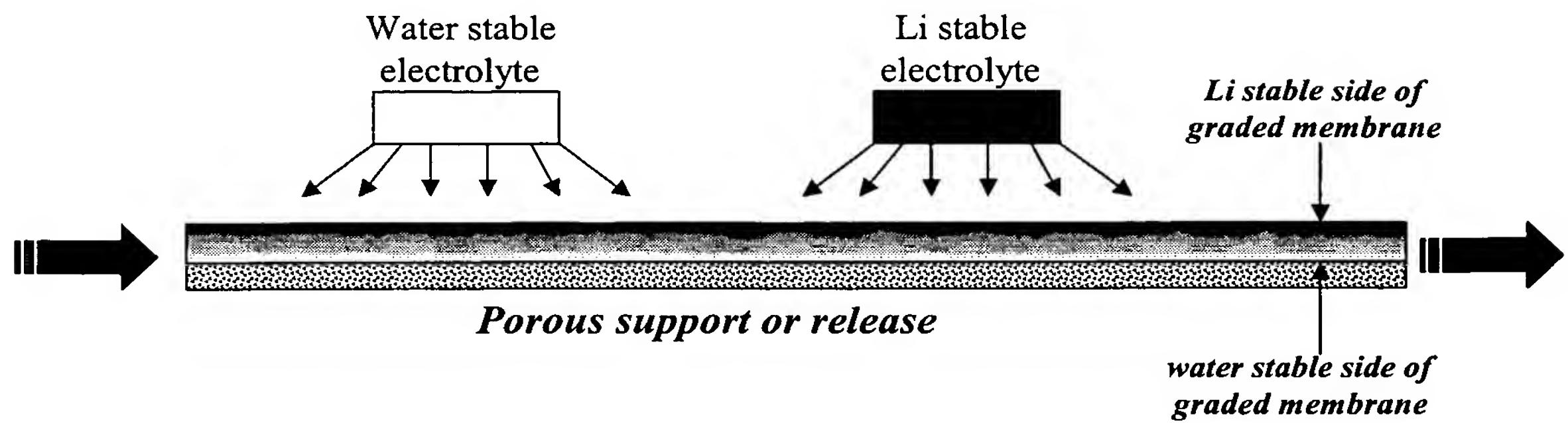


**FIG. 4A**

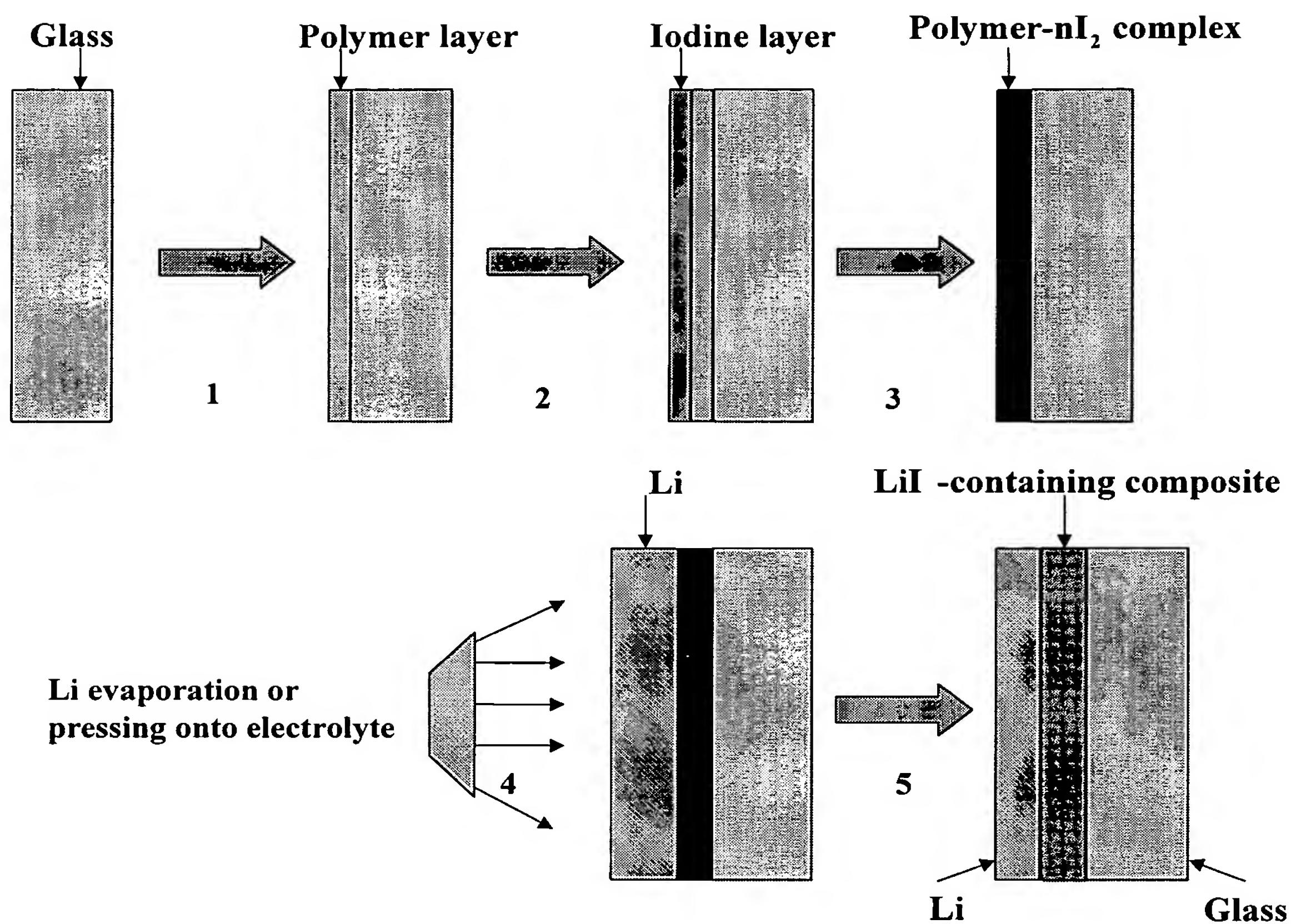


**FIG. 4B**

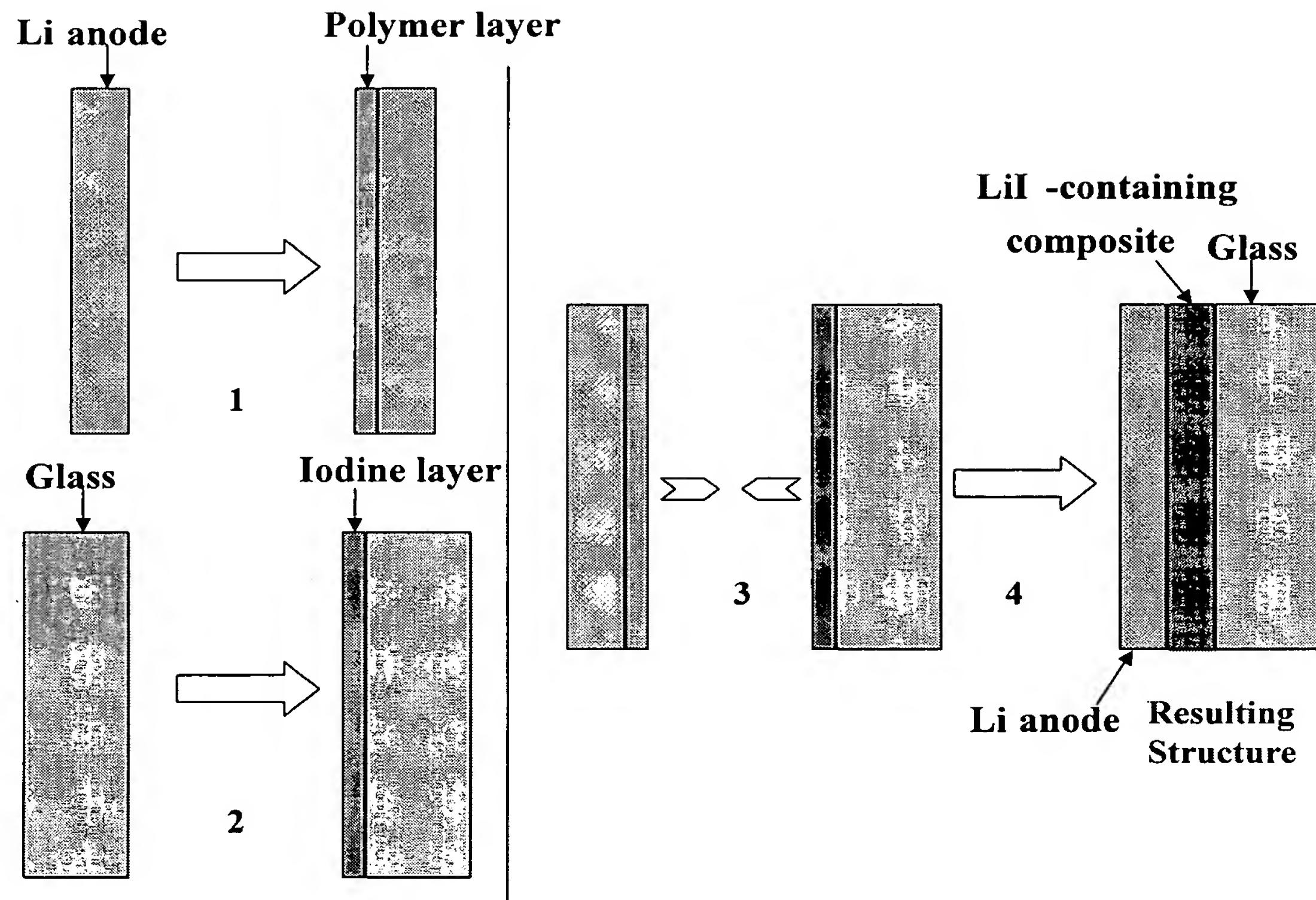
Plasma spray, Physical Vapor Deposition, etc.



**FIG. 5**



**FIG. 6A**



**FIG. 6B**

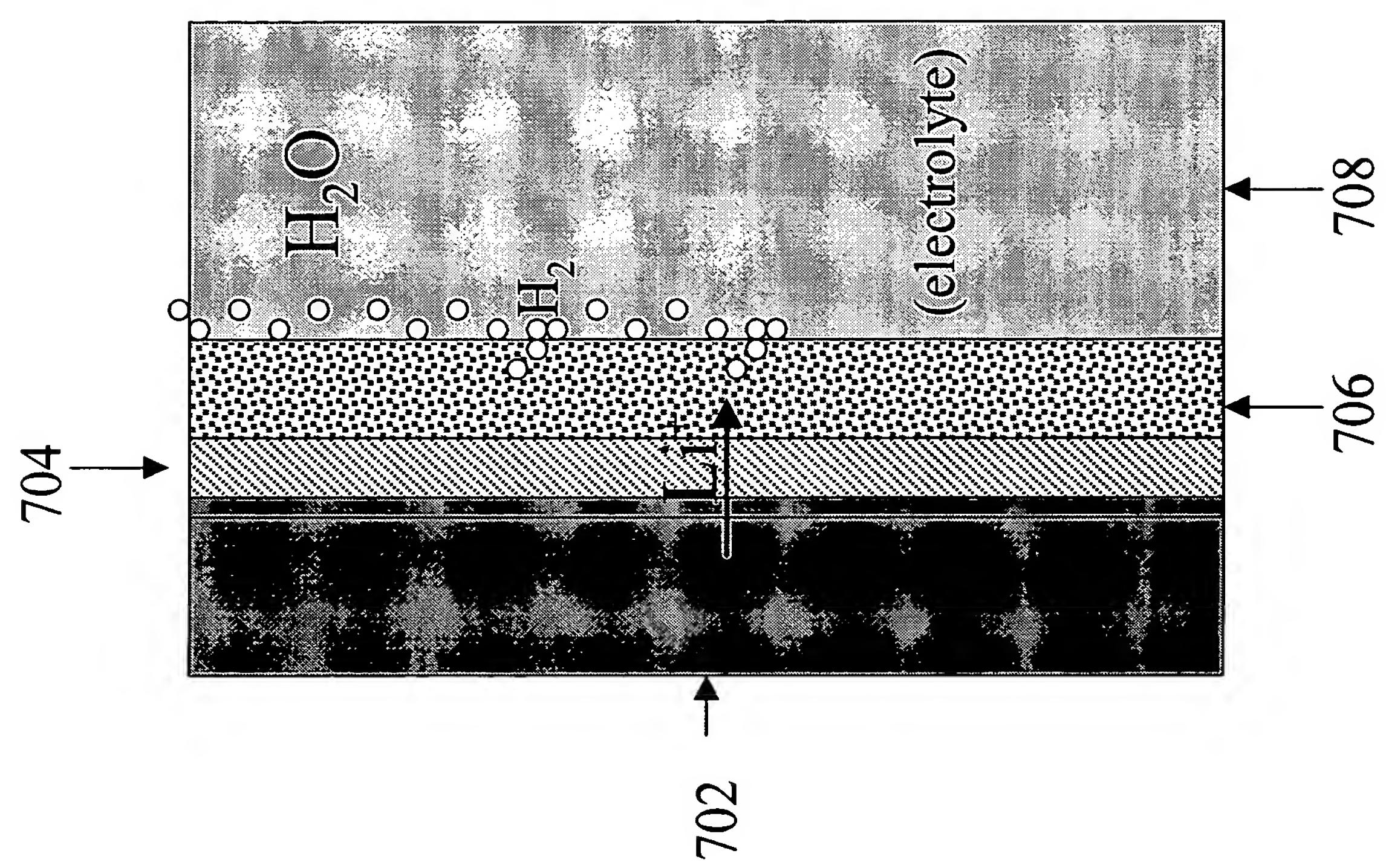
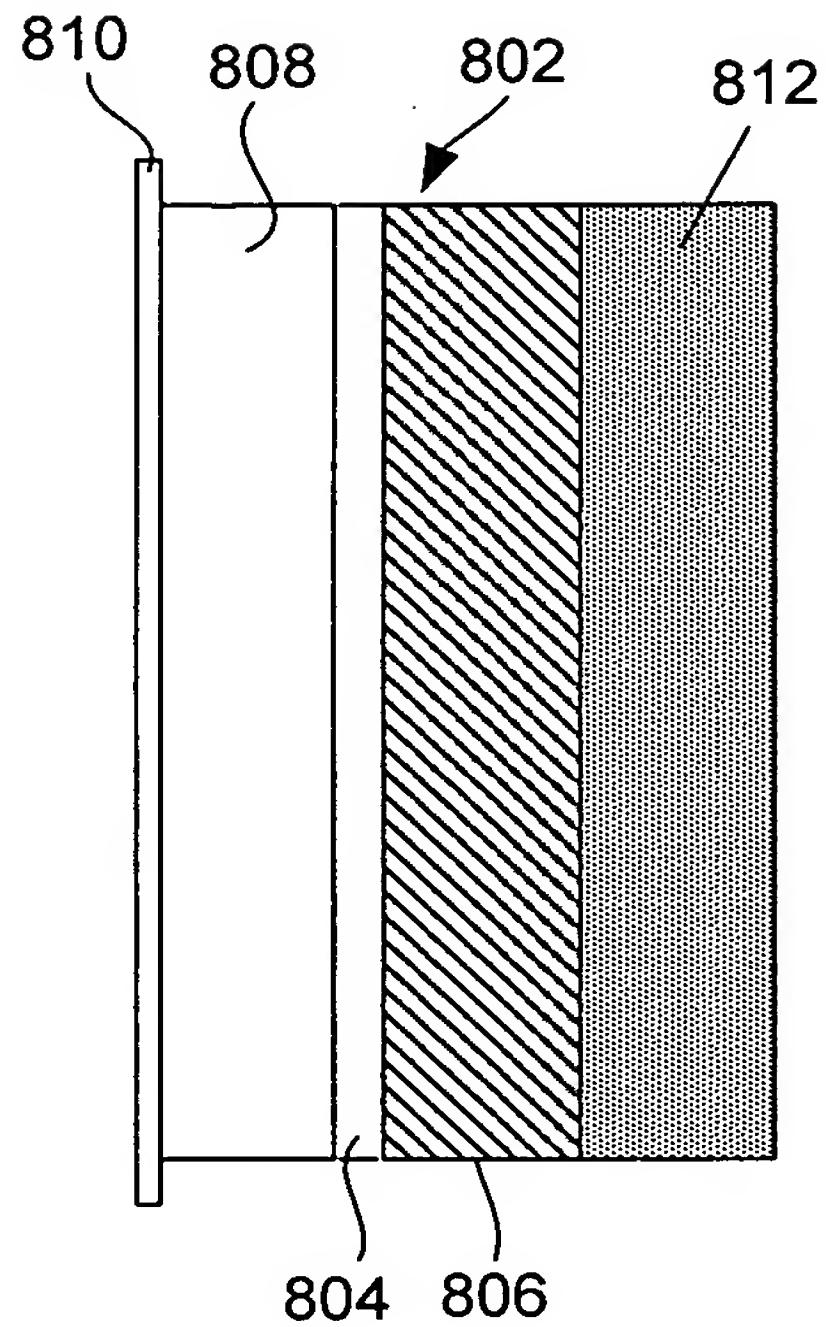


FIG. 7



**FIG. 8**

## Lithium/Metal Hydride Battery

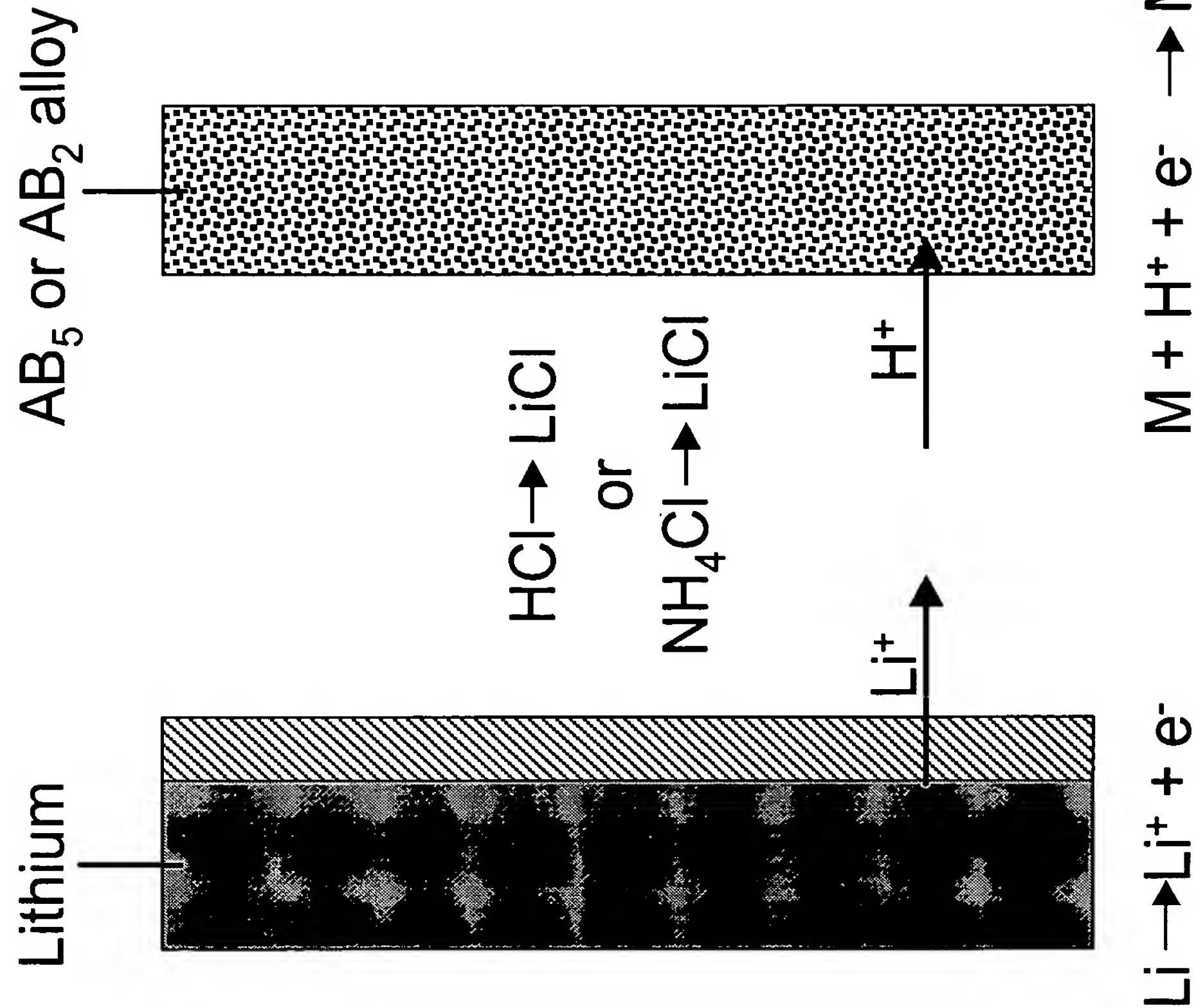
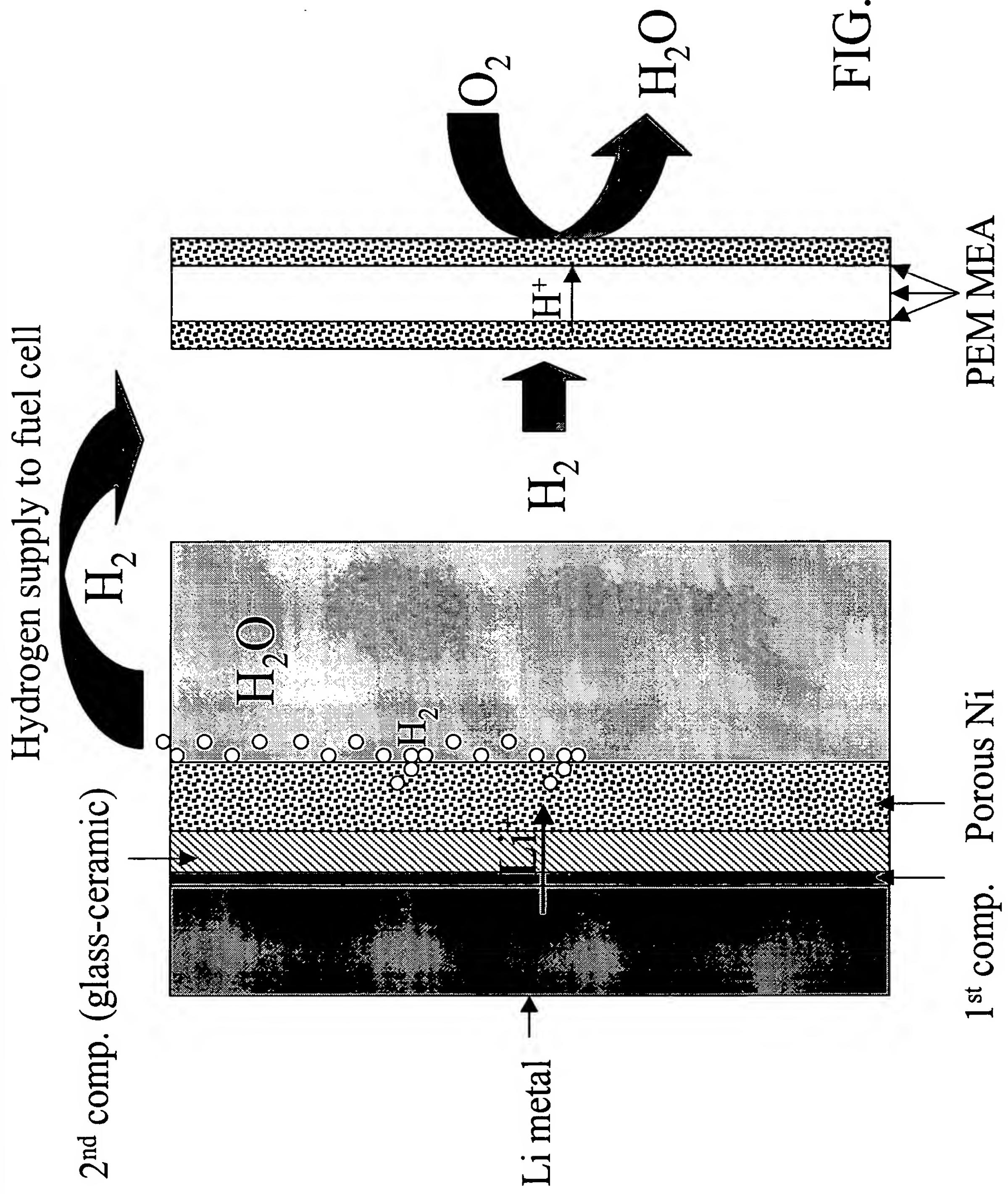


FIG. 9

# Li/water Battery and Hydrogen Generator for Fuel Cell



## Fabrication of thin, $\text{Li}^+$ conducting glass film on porous support

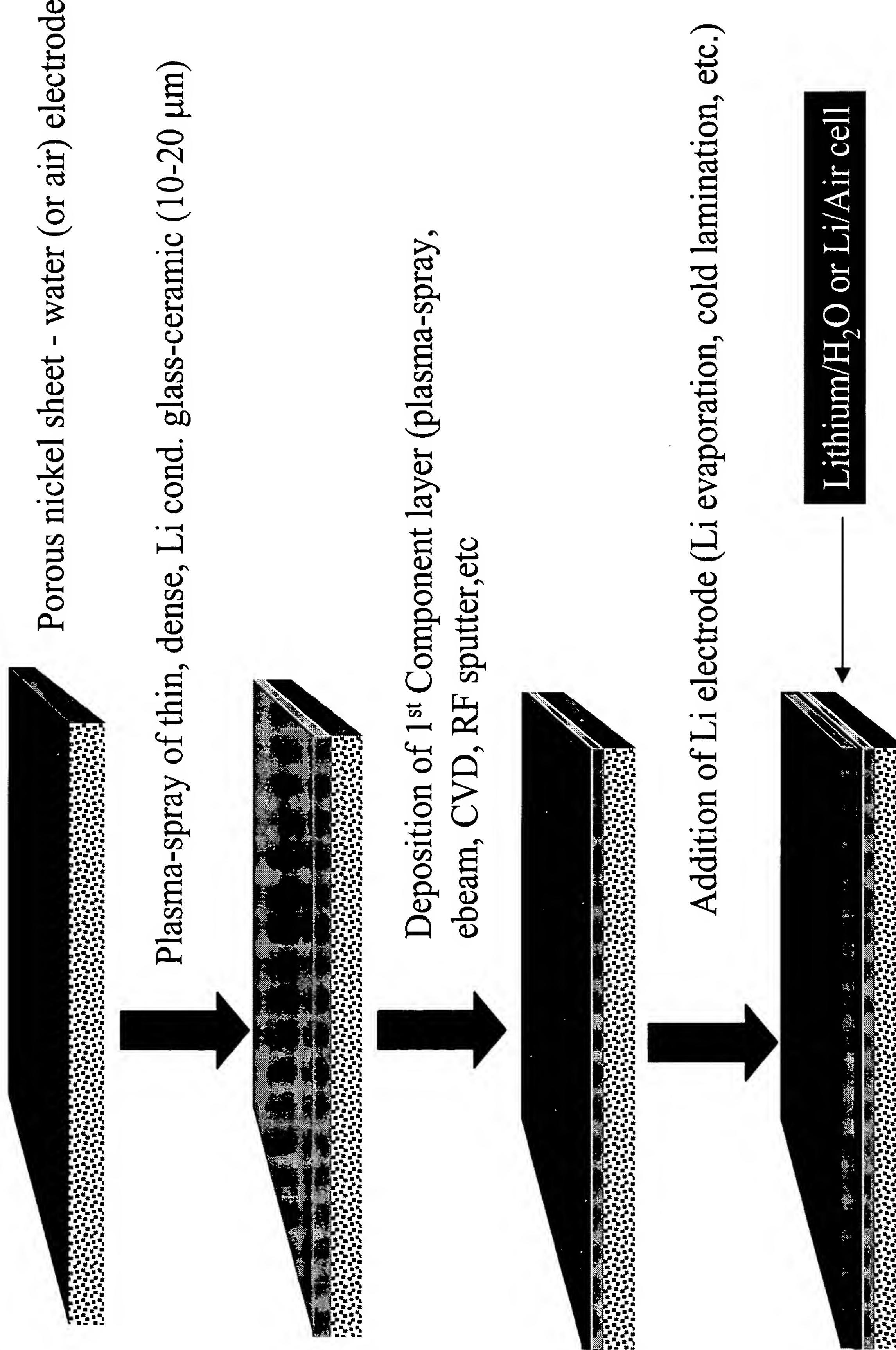
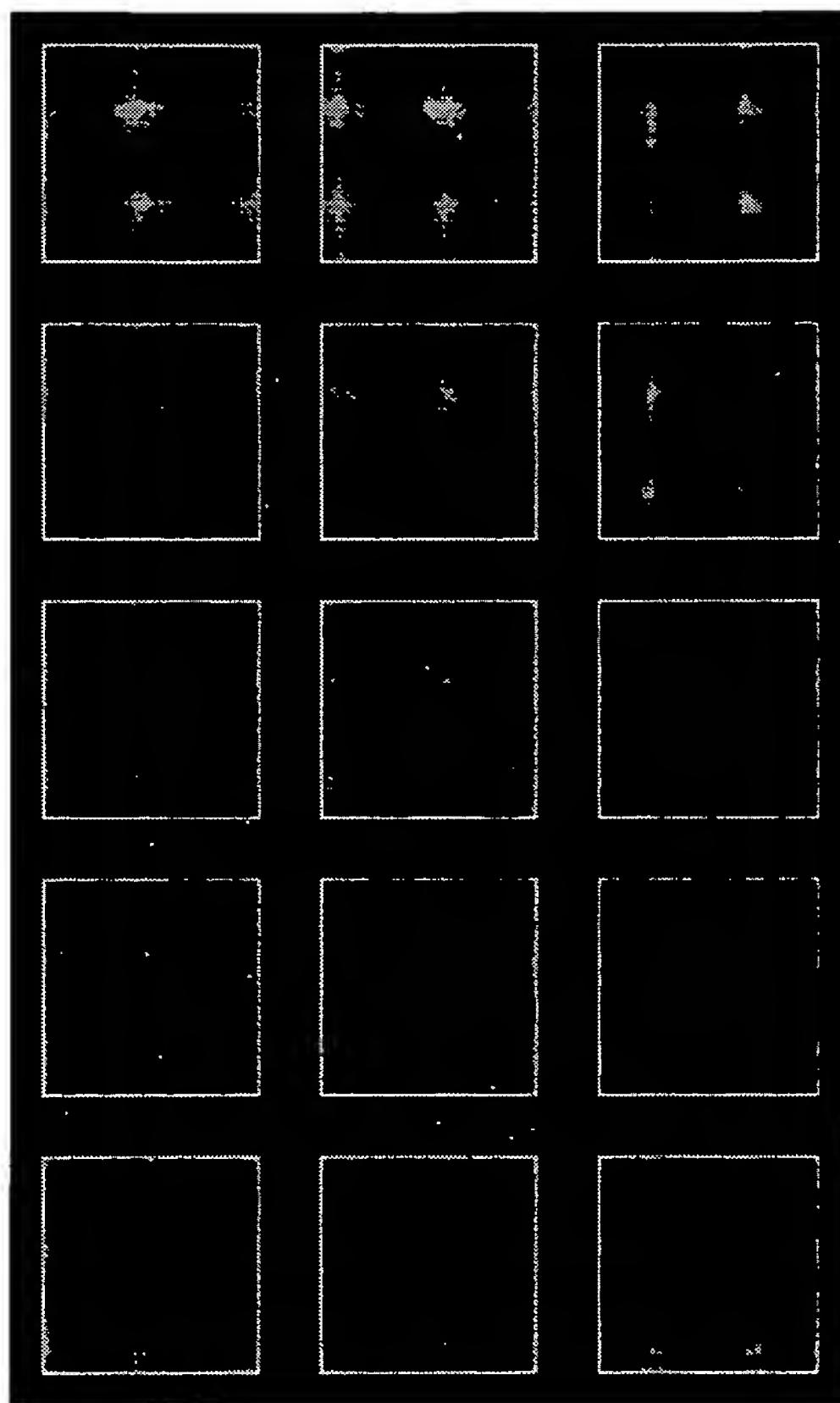
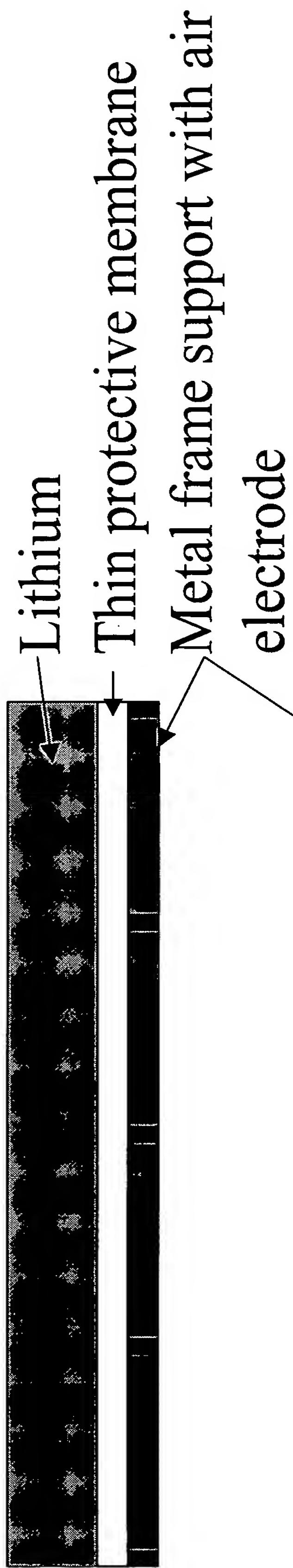


FIG. 11

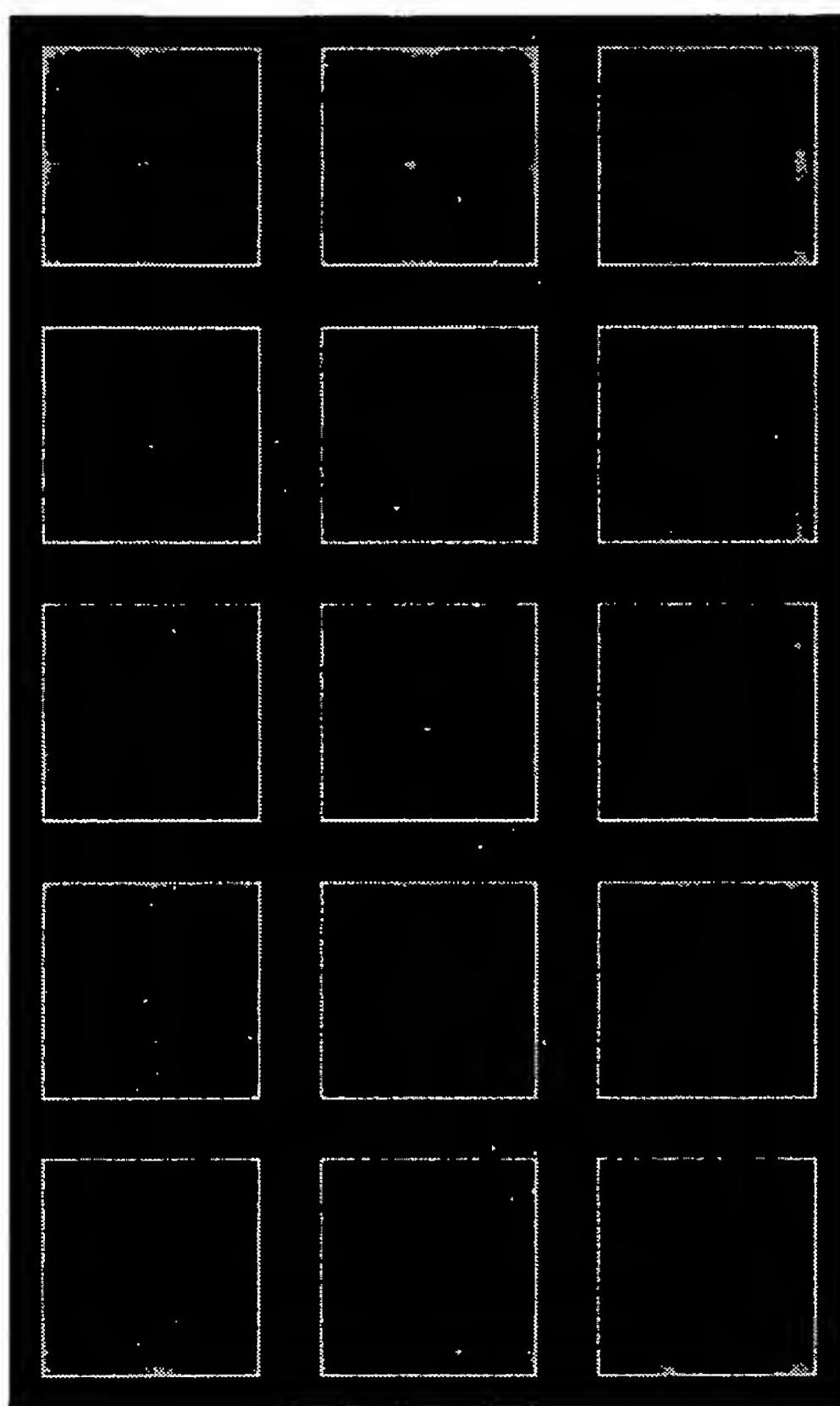
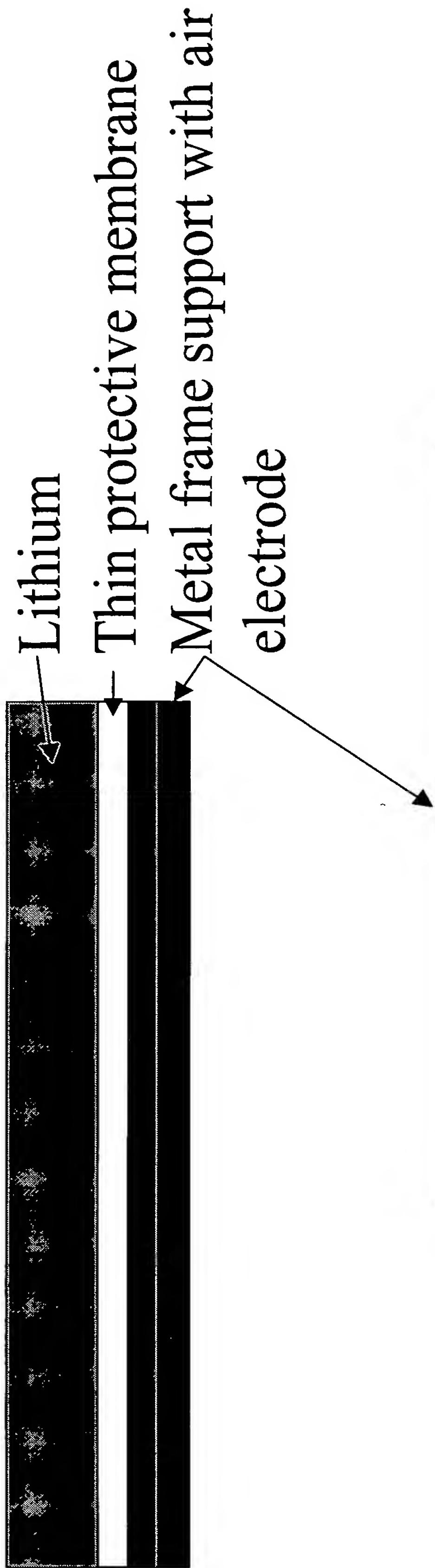
Side view



Bottom view

Figs. 12A-B

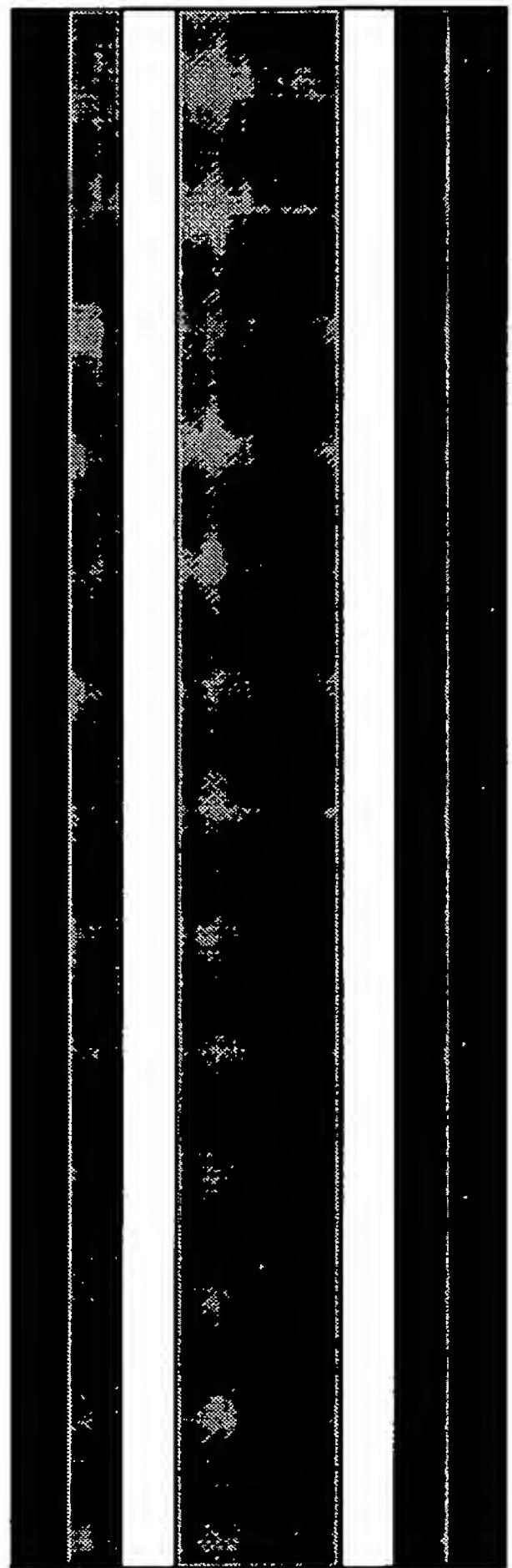
Side view



Bottom view

Figs. 12C-D

Side view



Li/water or Li/air bilayer structure

Fig. 12E

## Use of elastomeric seals to create flexible glass array

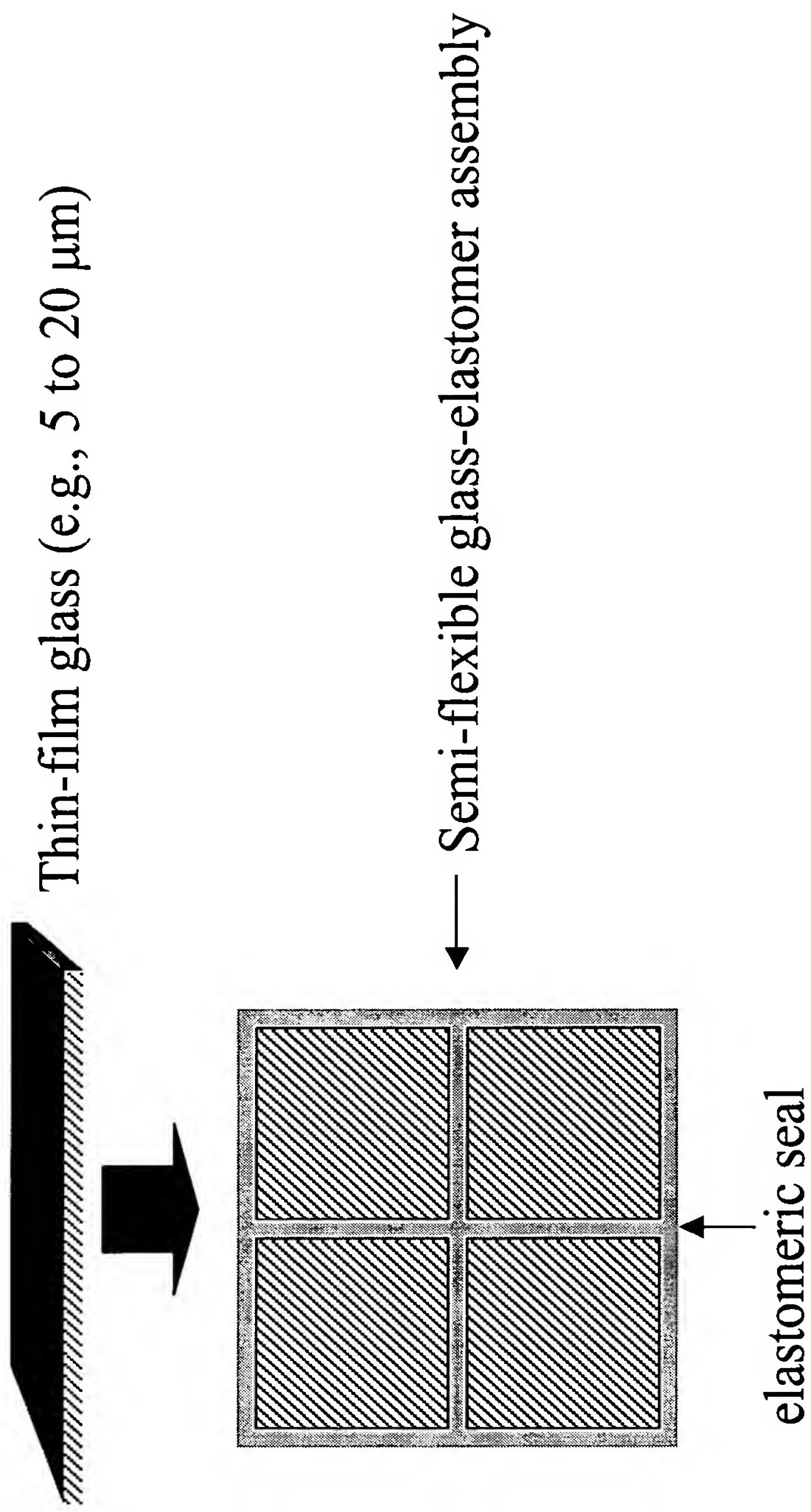


FIG. 13

## Tubular Li-water or Li-air cell

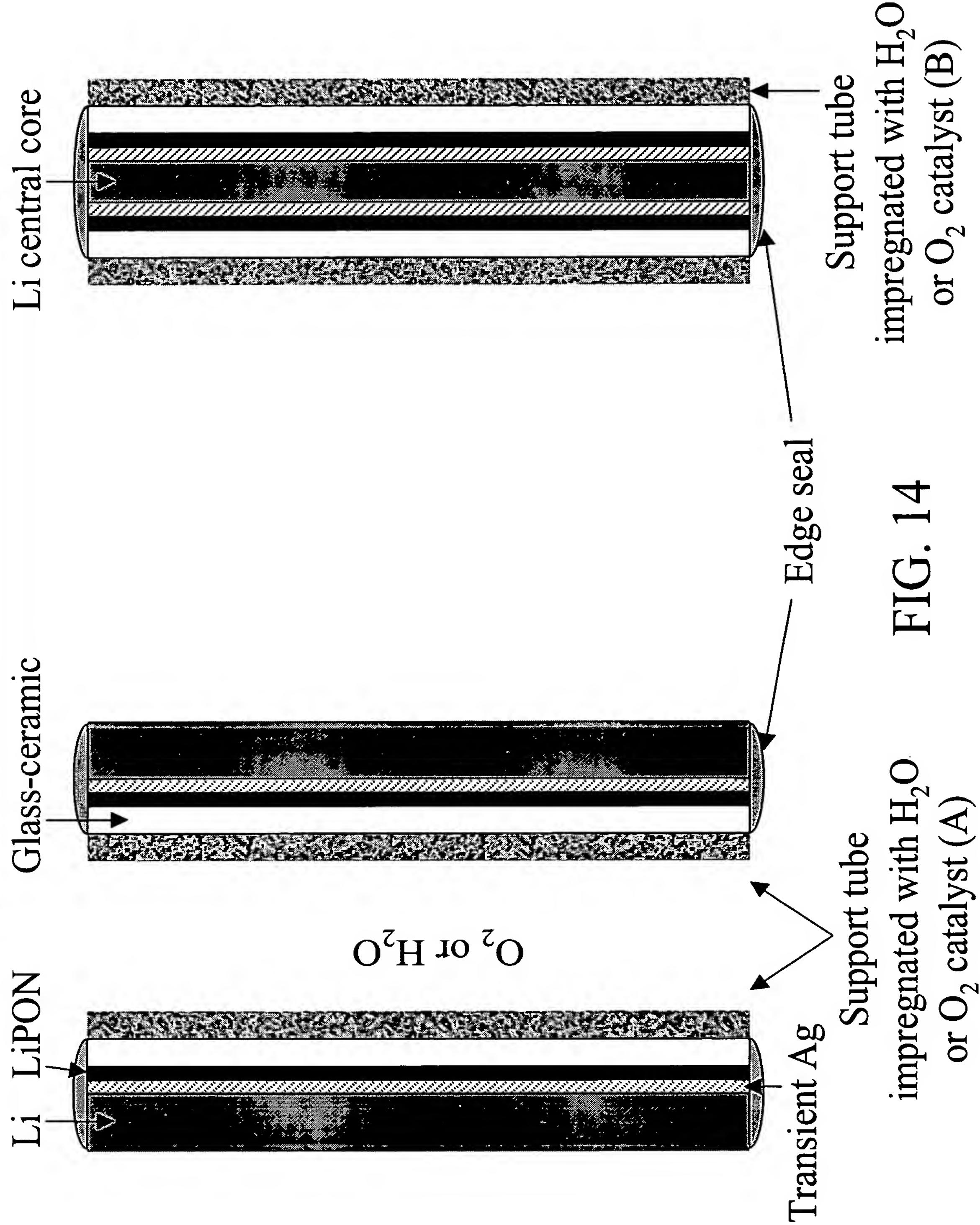


FIG. 14

imregnated with  $H_2O$   
or  $O_2$  catalyst (A)

imregnated with  $H_2O$   
or  $O_2$  catalyst (B)

## Use of thin-walled hollow glass fibers for Protected Li

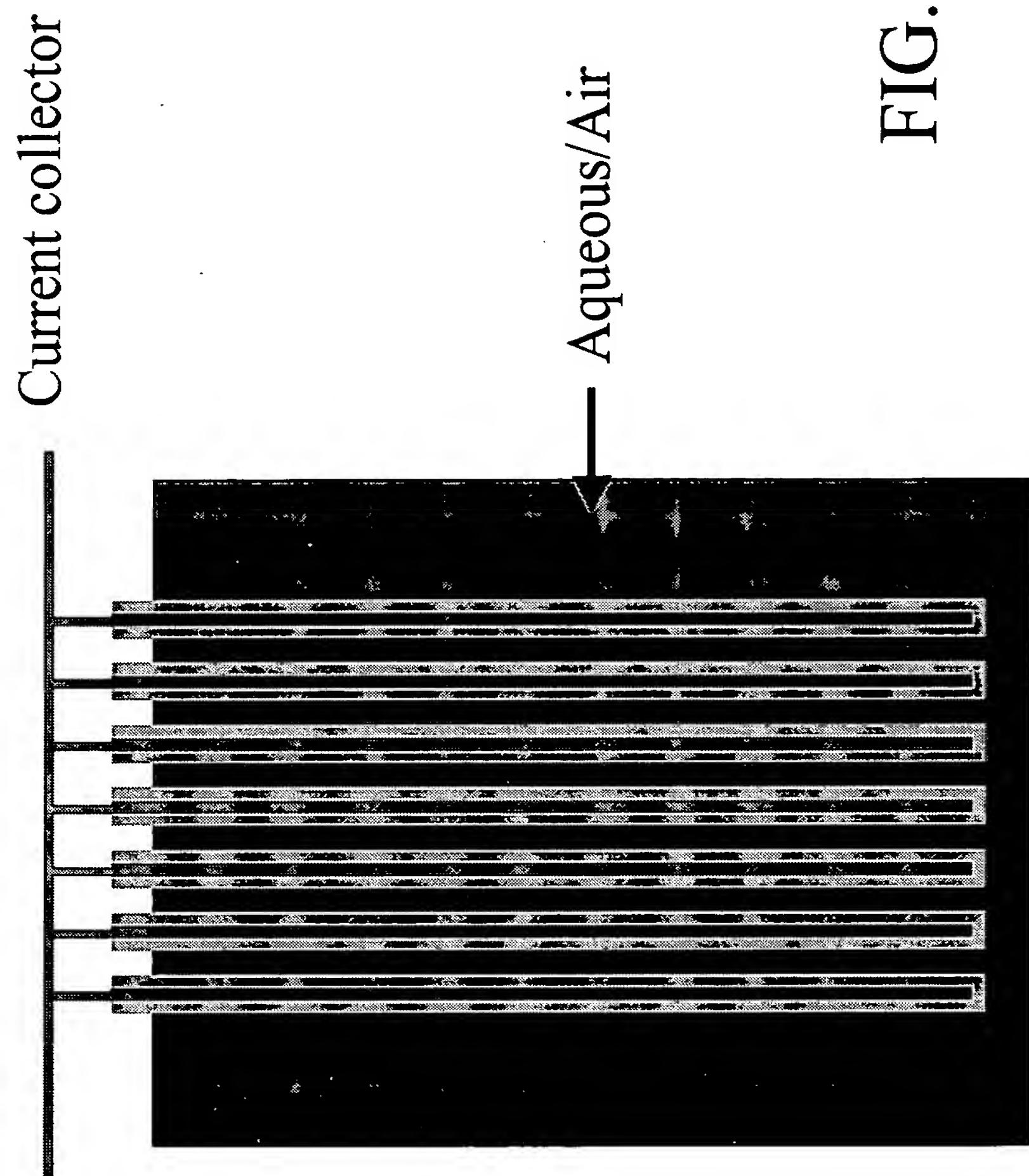


FIG. 15

# Protected Li Laminate Electrode

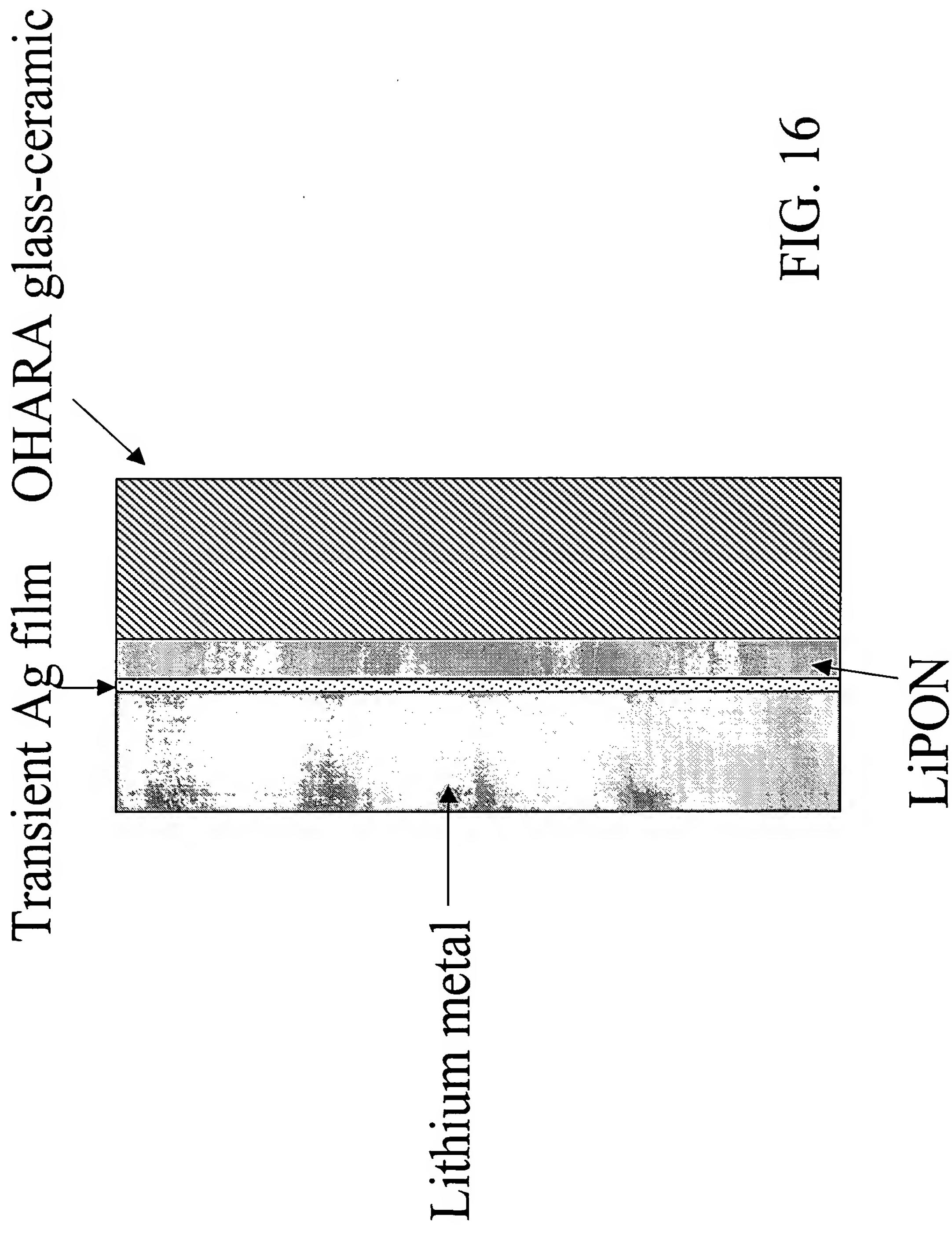


FIG. 16

**Potential – time Curve for Anodic Dissolution of Protected Li  
Electrode in 0.5M HCl + 1.0M LiCl, Water Solution**

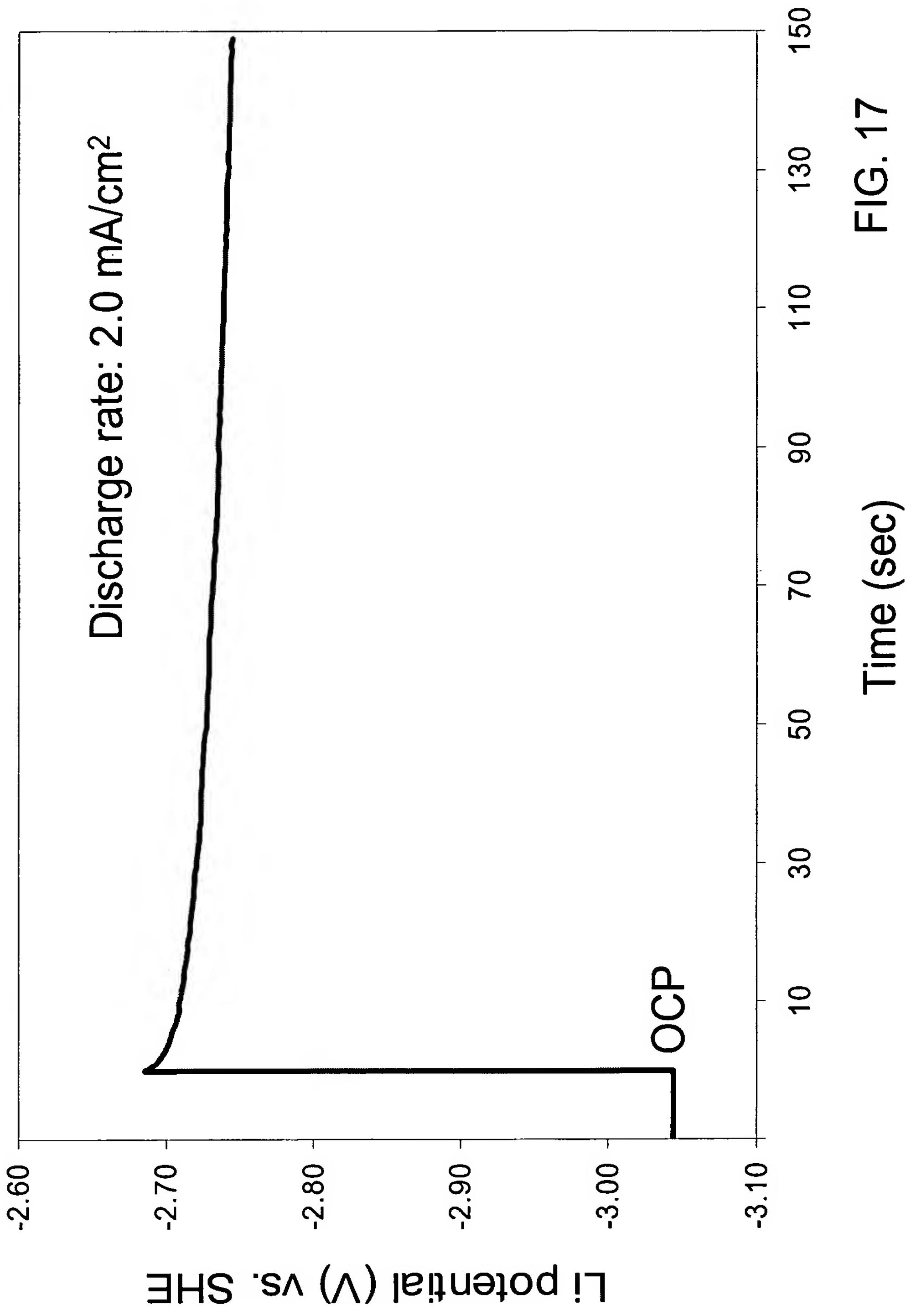


FIG. 17

## Potential – time Curve for H<sub>2</sub> Evolution at Pt Cathode in the Cell with Li Protected Anode

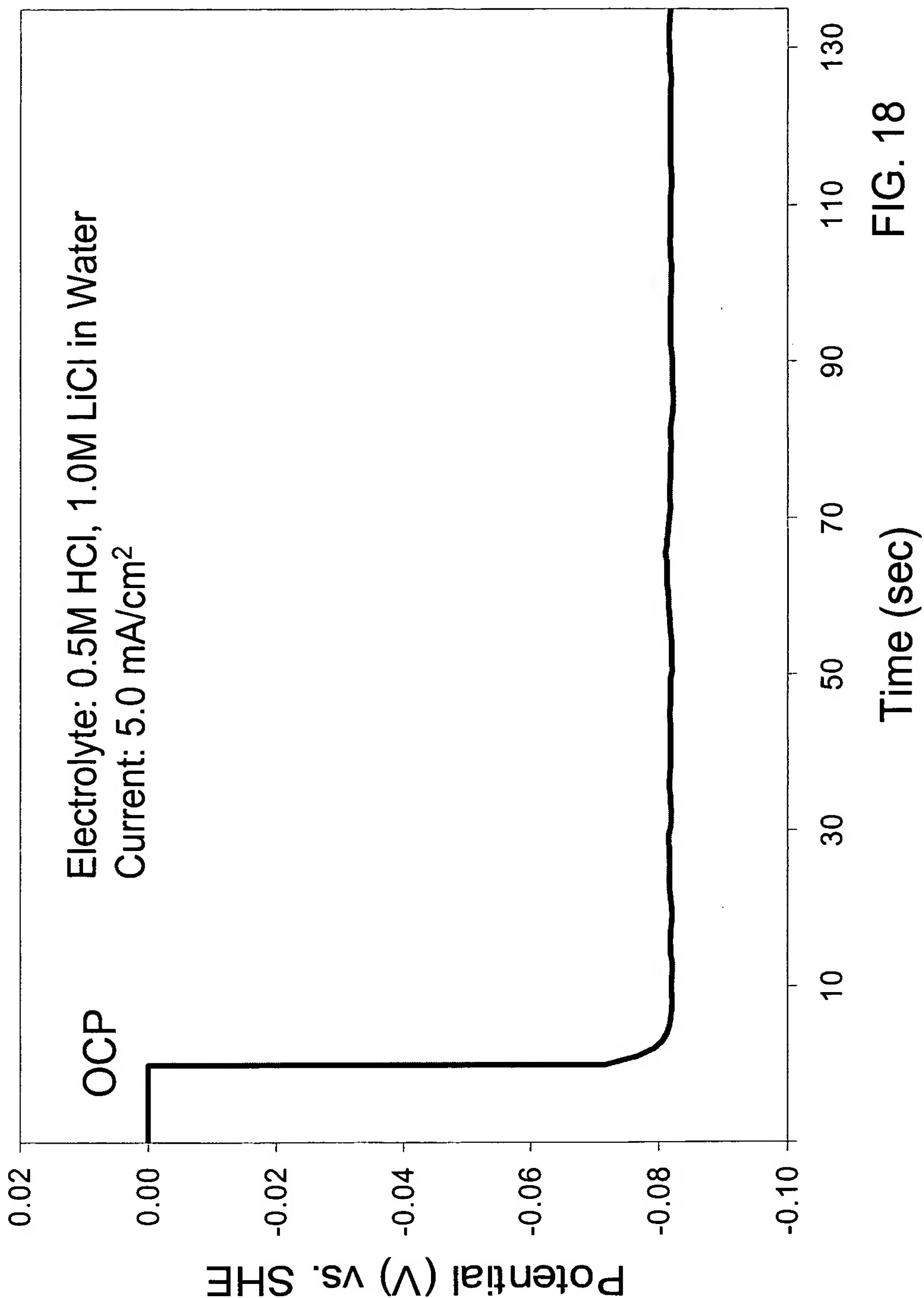


FIG. 18

**Potential – time Curve for Anodic Dissolution of Protected Li  
Electrode in 4M LiOH, Water Solution**

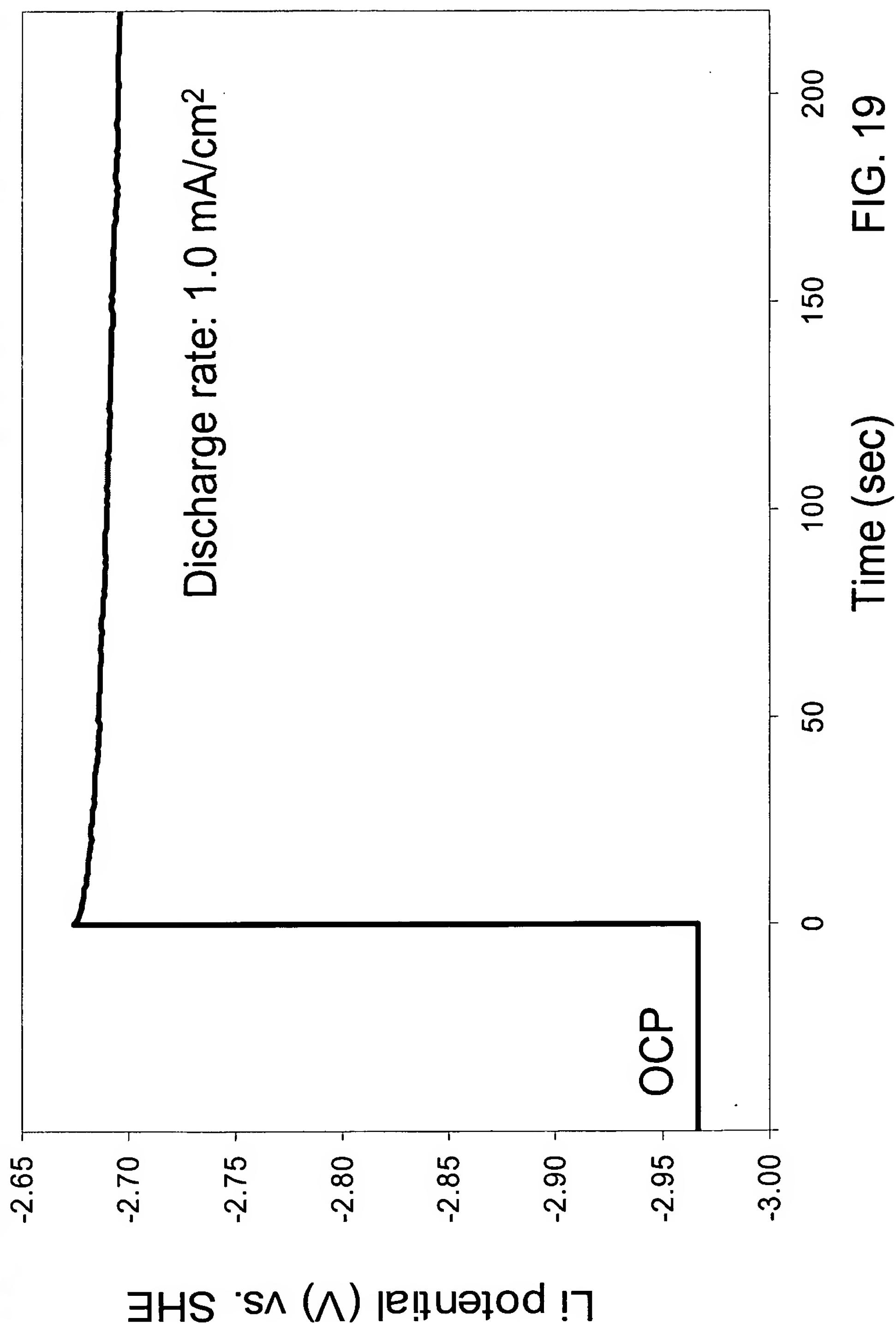


FIG. 19

## Cycling of Protected Li Anode in Aqueous Electrolyte

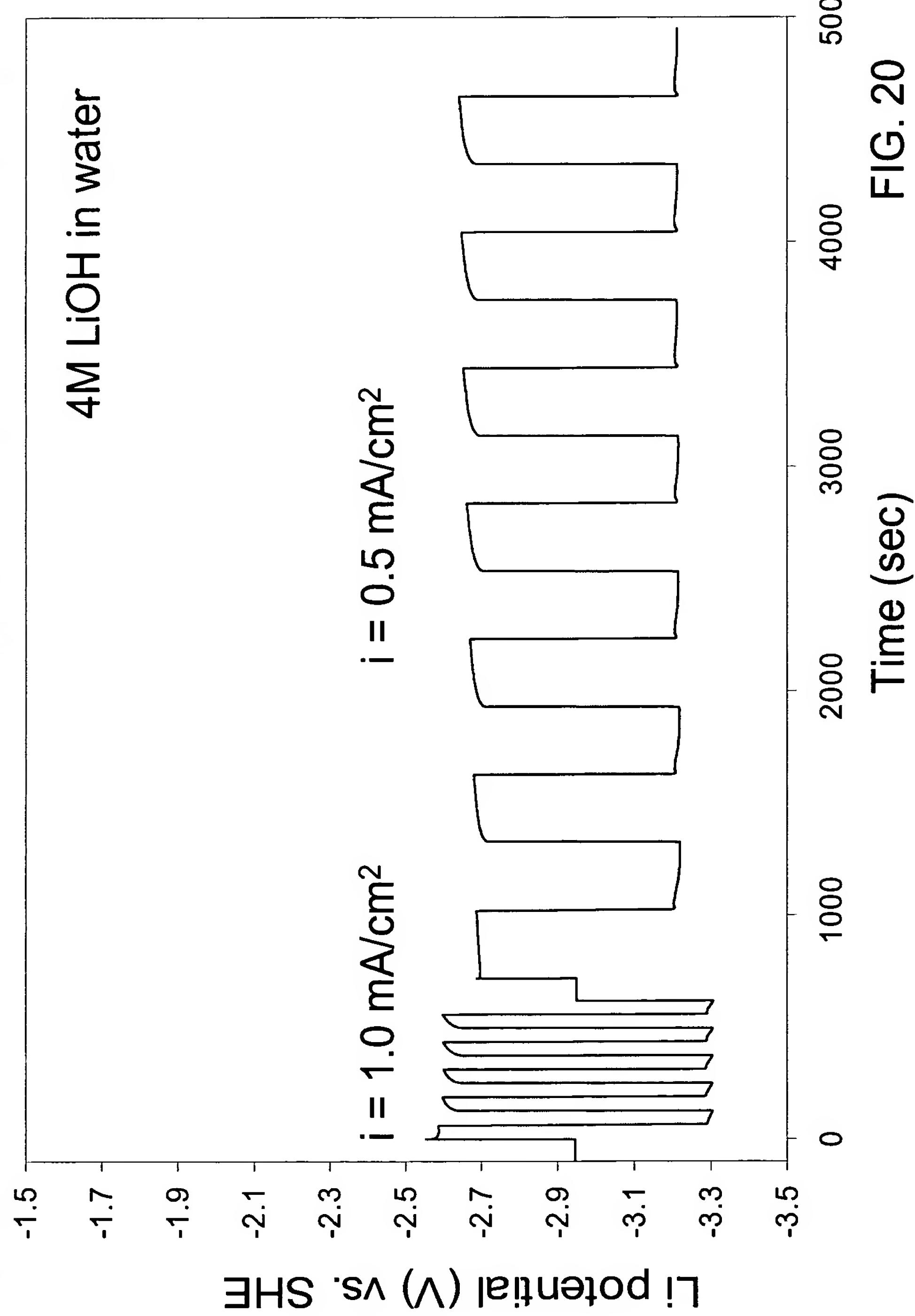


FIG. 20

## Cycling Performance of Protected Li Electrode in 4M LiOH, Water Solution

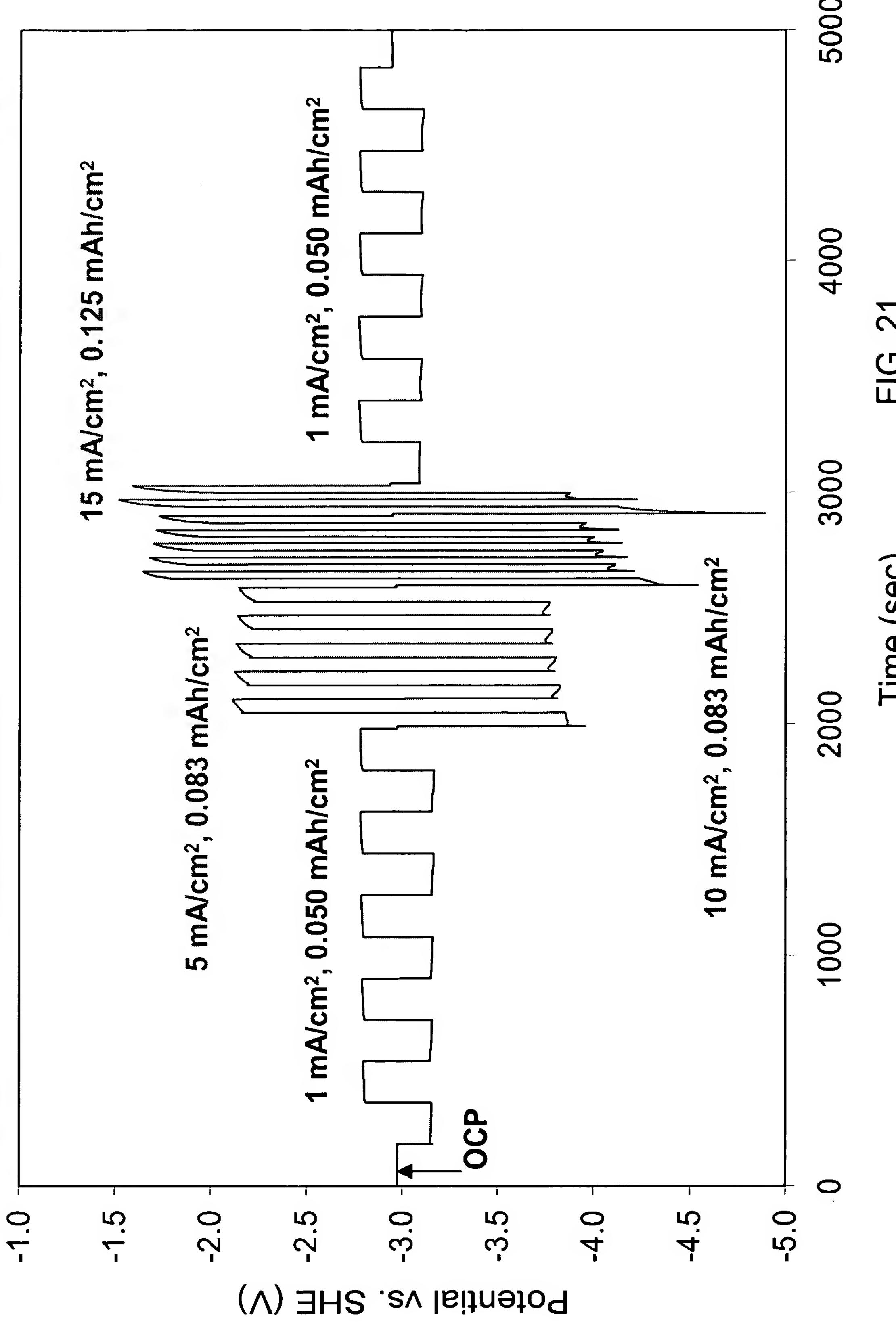


FIG. 21

Potential-time Curve for Anodic Dissolution of  
Protected Li Electrode in Seawater

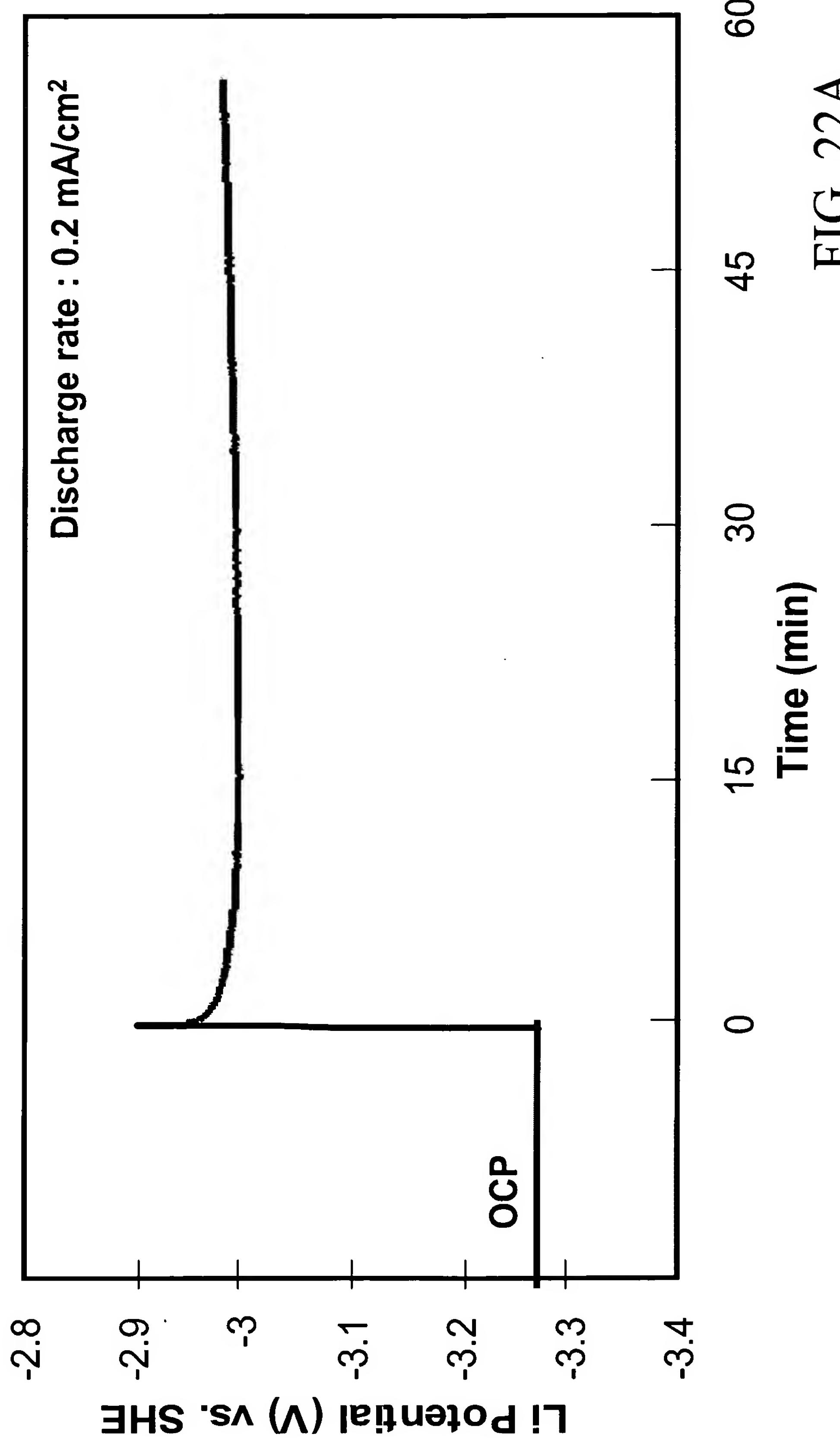


FIG. 22A

Potential-time Curve for Anodic Dissolution of  
Protected Li Electrode in Seawater

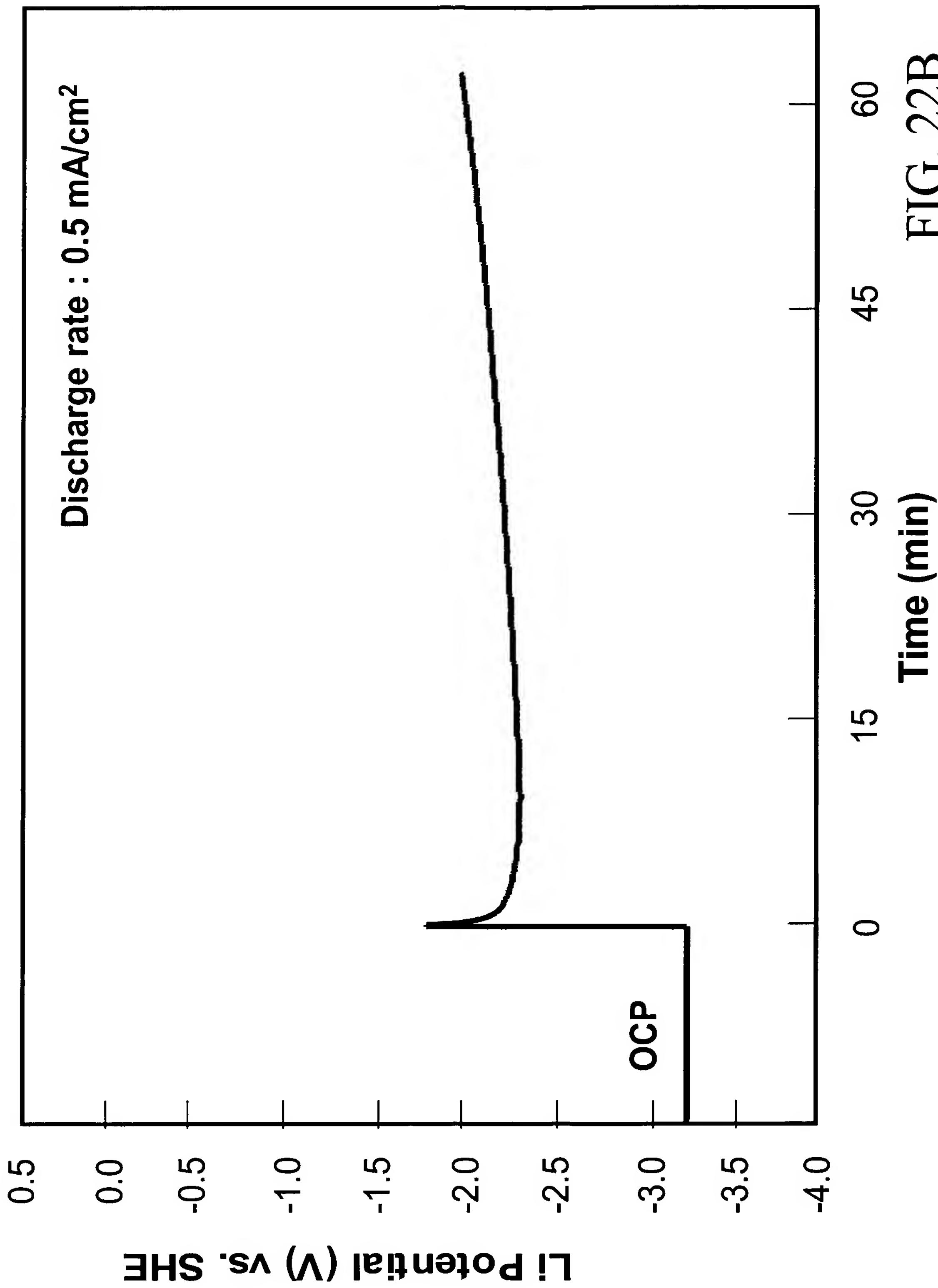


FIG. 22B

## Discharge of Li/Seawater Cell with Protected Li Anode and Pt Cathode

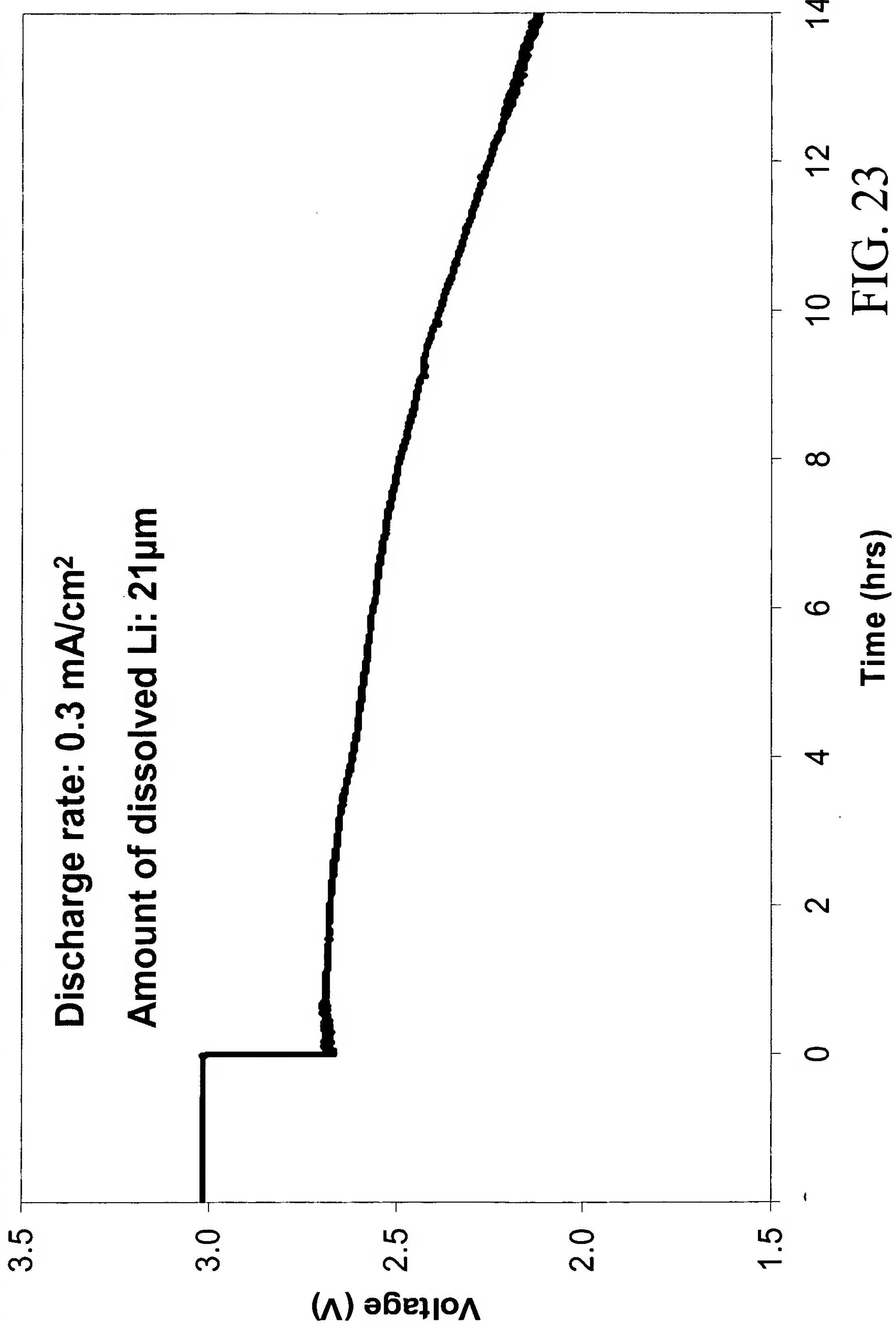


FIG. 23

## Discharge of Cell with Protected Li Electrode and Aqueous Electrolyte Containing Hydrogen Peroxide

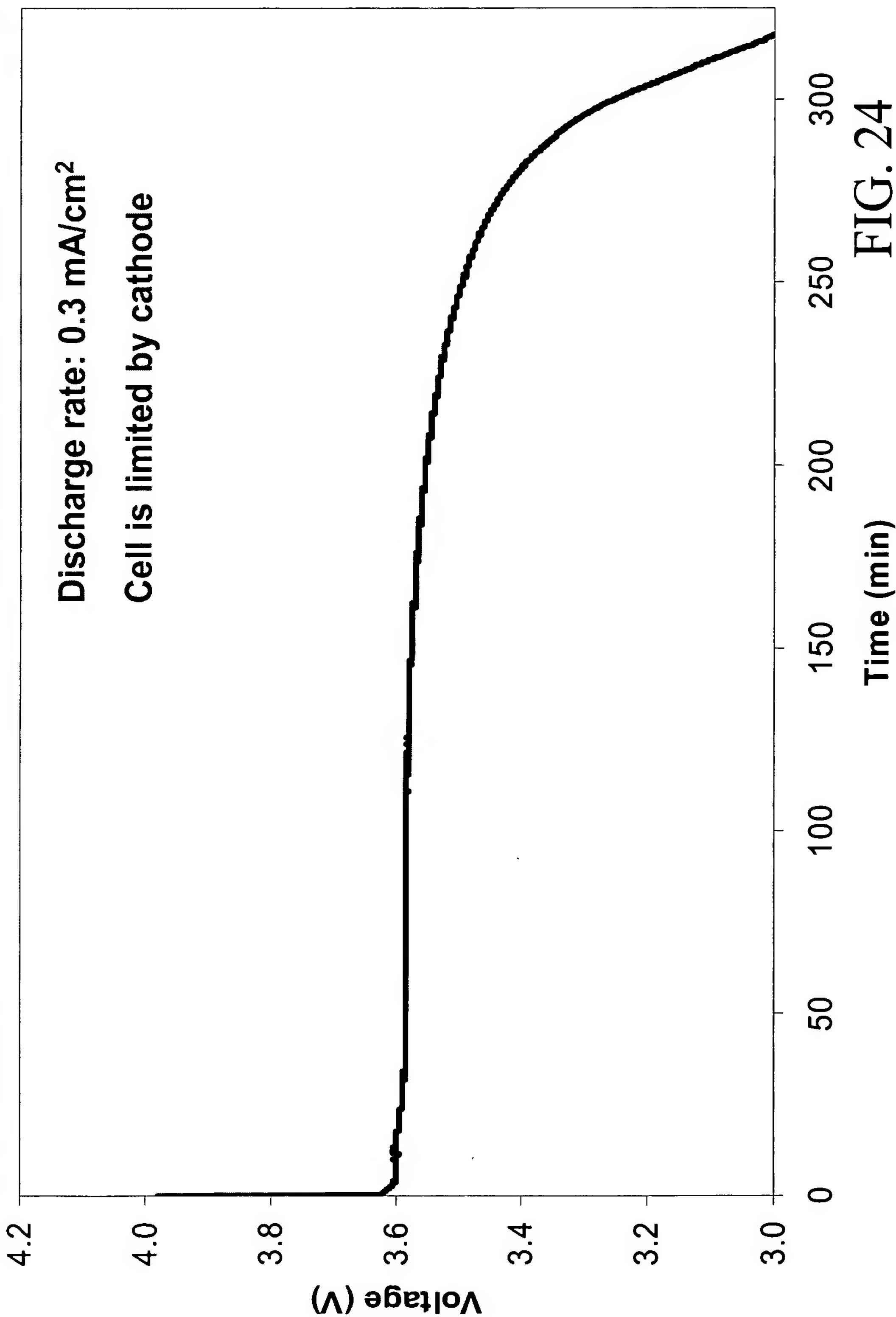


FIG. 24

## Discharge of Li/Air Cell with Protected Li Electrode and Neutral Electrolyte

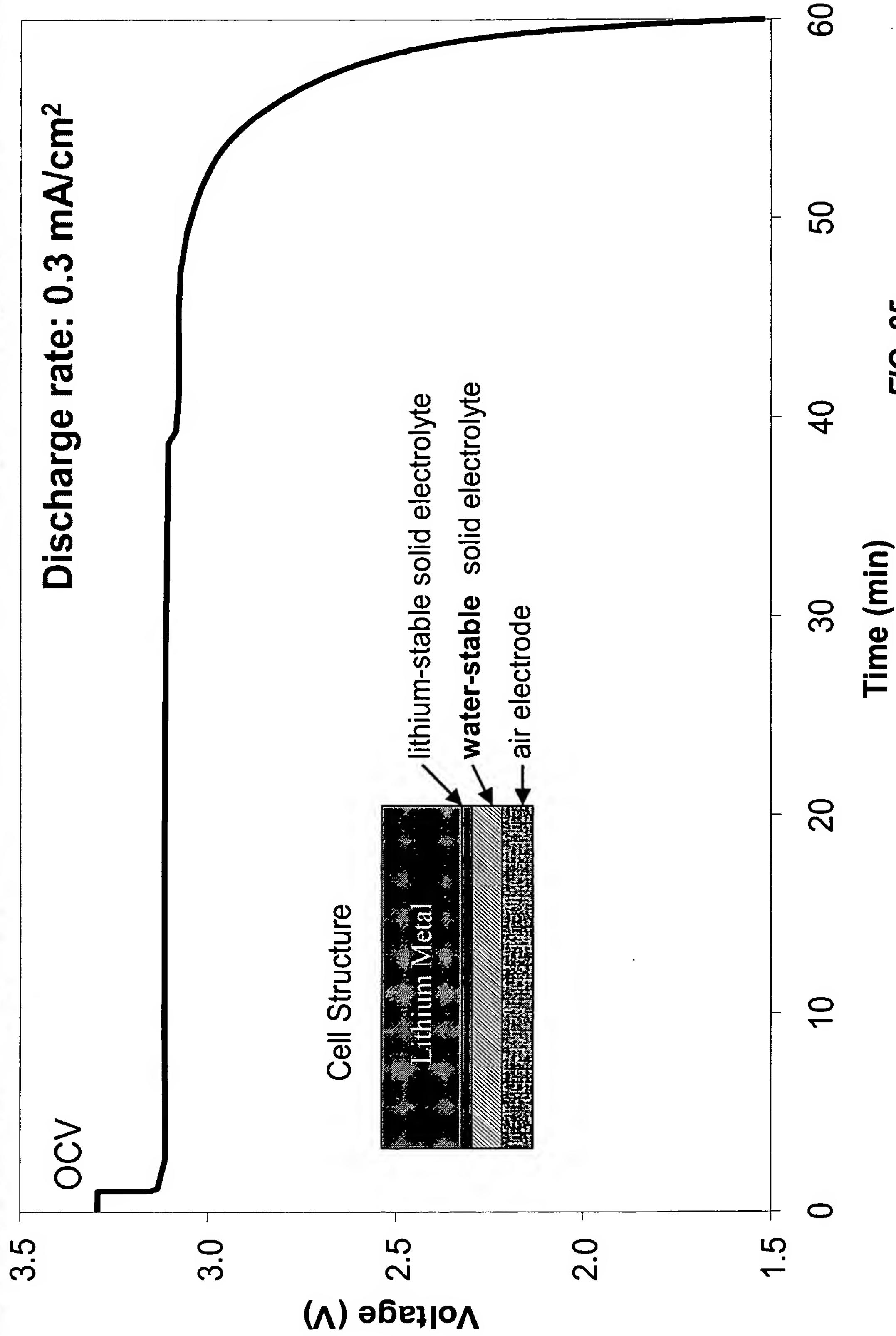


FIG. 25

# Discharge of Li/Air cell with Protected Li Electrode

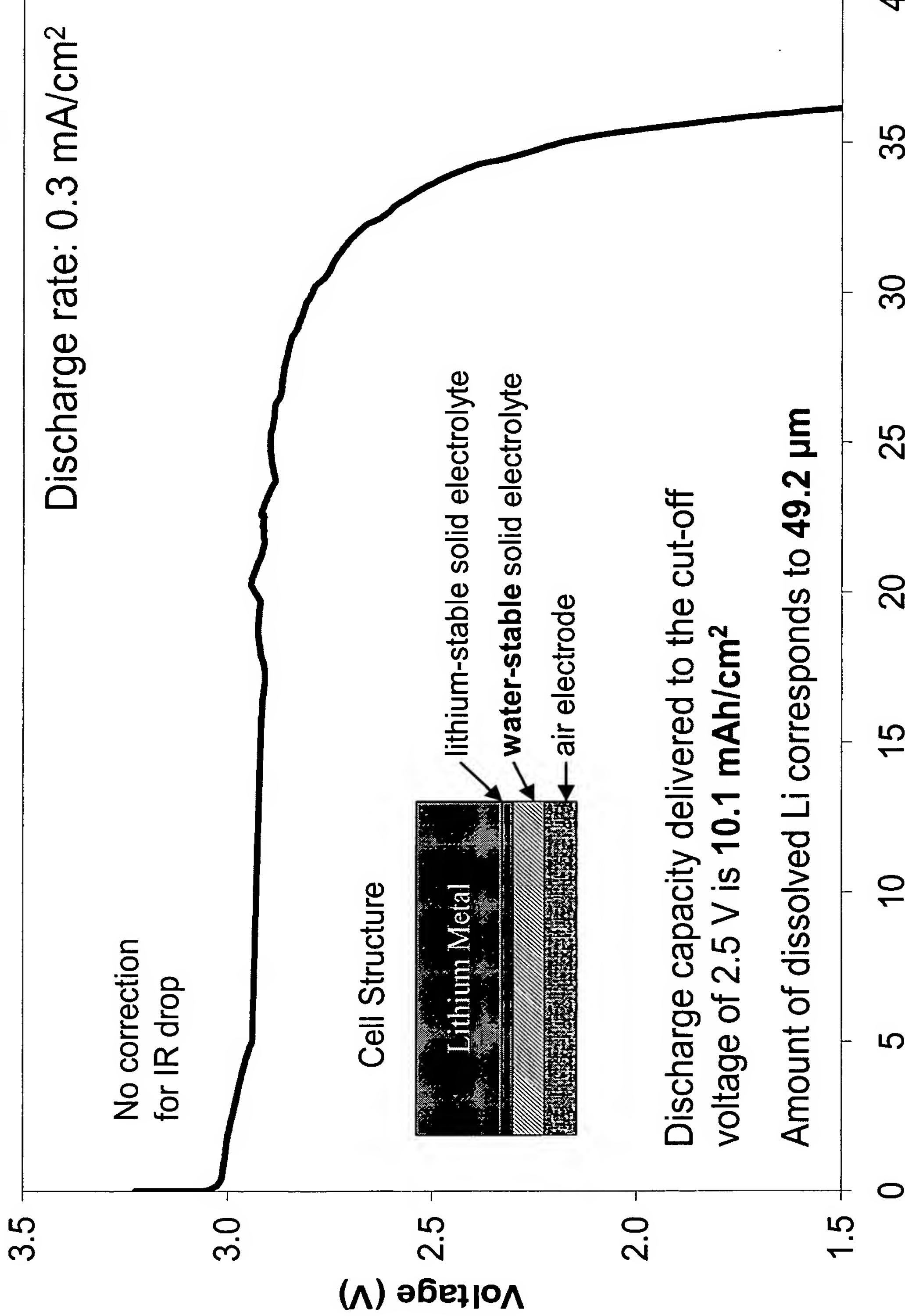


FIG. 26

## Cycling of Li/Air cell with Protected Li Electrode

Charge/Discharge Rate: 1.0 mA/cm<sup>2</sup>  
Electrolyte: 1 M LiOH

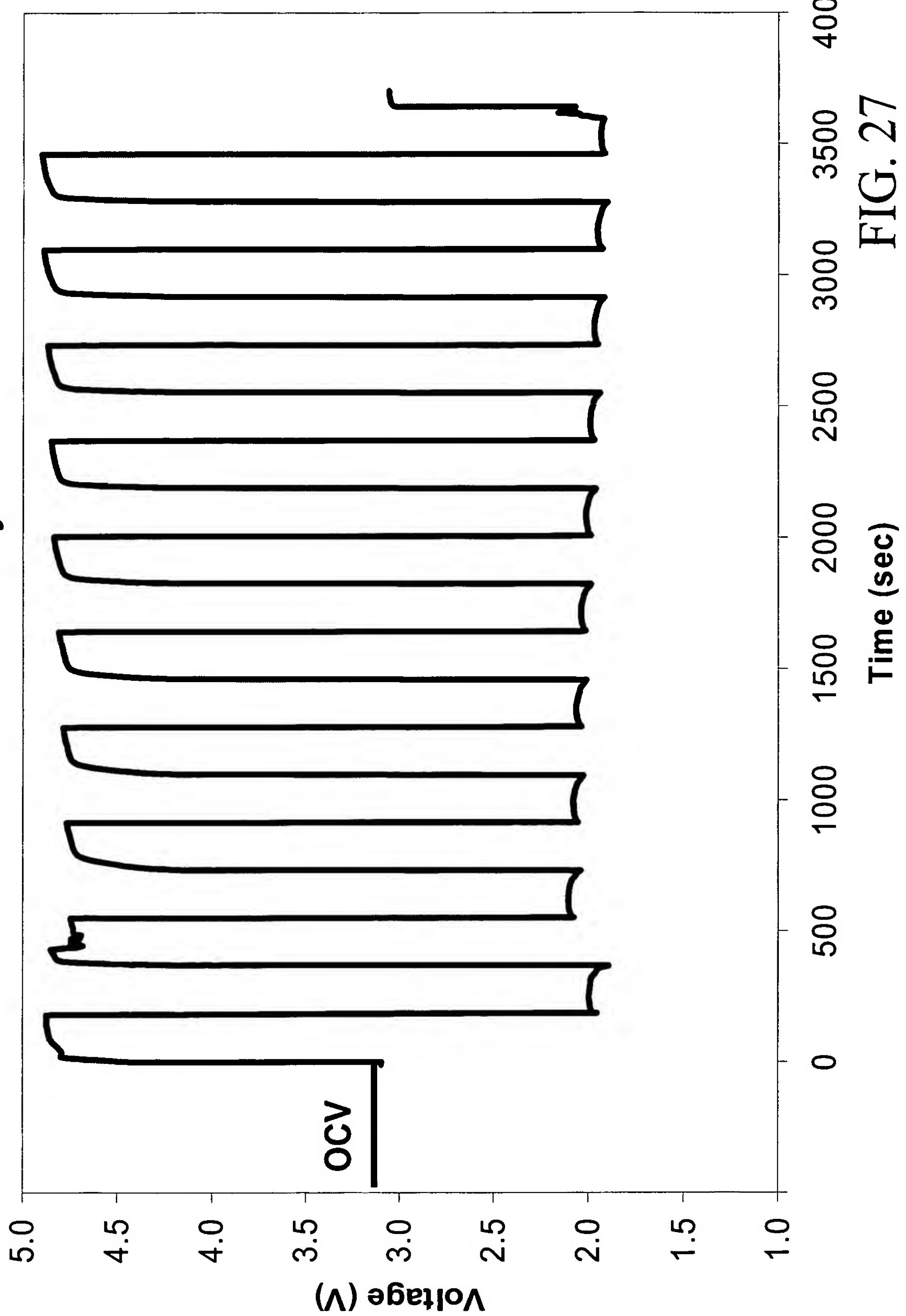


FIG. 27